Refrigeration Service Engineer

VOL. 16 | NO. 10 ★ ★ ★ OCTOBER - 1948

20 New— CHICAGO VALVE PLATES

Number	Compressor Model
	BRUNNER
● 559	Single Cylinder
● 748	R-2000, R-5000
	FRIGIDAIRE
● 575	4E, 5F, 6G, F4F, FS6
	GENERAL ELECTRIC
● 705	CM3 Series (Hollow Casting) C21A39, C21A43
	JACK & HEINTZ
● 747	All Open Models
	MERCHANT & EVANS
● 557	250, 3325, 450 (1936)
● 571	Single Cylinder
● 572	140, 180
● 573	625, 725, 1125 (1936)
● 517	Single Cylinder

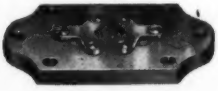
Number	Compressor Model
	O'KEEFE & MERRITT
● 576	1¼", 1⅜", 1½", 1¾" Cyl.—Methyl Chloride
● 744	1¼", 1⅜", 1½", 1¾" Cyl.—Sulphur Dioxide
	Commercial
● 745	**PAR**
● 749	S-15, S-15NS
● 750	S-100, T-100, R-200, S-200
	STARR FREEZE
● 574	Twin Cylinder
	SUPERCOLD
● 740	Model J
● 741	Model K
● 742	Model L
● 743	Model N

FOR BETTER PERFORMANCE

These 20 New Valve Plates are Designed to Fit 37 Compressor Models. This Greatly Increases the Scope of Your Service on Compressor Repairs.

ASK FOR THEM AT YOUR REFRIGERATION WHOLESALER

REPLACEABLE SEATS ARE EXCLUSIVE WITH CHICAGO VALVE PLATES



CHICAGO SEAL CO.

332 S. HOYNE AVE.
CHICAGO 12, ILL.

THE REFRIGERATION SERVICE ENGINEER, Nickerson & Collins Co., Publishers, 433-435 N. Waller Ave., Chicago 44, Ill. Published monthly. Vol. 16, No. 10, October, 1948. Entered as second-class matter March 4, 1938, Chicago, Ill., under the Act of March 3, 1879. Additional entry at Beloit, Wis., April 15, 1948. Copyright 1948. Subscription in the U. S. $3.00 per year, other countries $4.00.

A tiny drop of water . . .

REFRIGERATION'S BIGGEST PROBLEM!

Important Questions

. . . IN SELECTING A DRIER

1. Does the material dry the refrigerant below the corrosion limits when placed in the liquid line? In the suction (vapor) line?
2. Does the material dry the refrigerant below the limits for ice formation with methyl chloride and the "Freon" refrigerants?
3. Does the material accomplish the drying in one passage of the refrigerant, or is it slow, i.e., requires several passages?
4. Does the material deteriorate in physical character in handling or when it removes water from the refrigerant?
5. Does the oil affect the drier adversely?
6. Does the drier corrode?

LIQUID Sulfur Dioxide ANSUL — LIQUID Methyl Chloride ANSUL

REG. U.S. PAT. OFF.

DRYING POWER OF VARIOUS MATERIALS

Drier	Refrigerant	Liquid or Vapor	Max. Residual Water Concentration After Passage Through Drier	
			.25% Initial Water Concentration	.02% Initial Water Concentration
ACTIVATED ALUMINA	Sulfur Dioxide	L	.15	.005
		V	.01	
	Methyl Chloride	L	.02	.006
		V	.01	
SILICA GEL	Sulfur Dioxide	L	.15	.006
		V	.01	
	Methyl Chloride	L	.01	.004
		V	.01	
DRIERITE (Calcium Sulphate)	Sulfur Dioxide	L	.15	.009
		V	.08	
	Methyl Chloride	L	.05	.003
		V	.04	
CALCIUM CHLORIDE $CaCl_2$	Sulfur Dioxide	L	.09	.013
		V	.03	
	Methyl Chloride	L	.10	.005
		V	.04	
CALCIUM OXIDE CaO	Sulfur Dioxide	L	.20	—
		V	.15	—
	Methyl Chloride	L	.15	—
		V	.08	—
BARIUM OXIDE BaO	Sulfur Dioxide	L	.20	.017
		V	.15	
	Methyl Chloride	L	.05	.006
		V	.05	

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ANSUL REFRIGERANTS ARE AVAILABLE AT LEADING WHOLESALERS EVERYWHERE

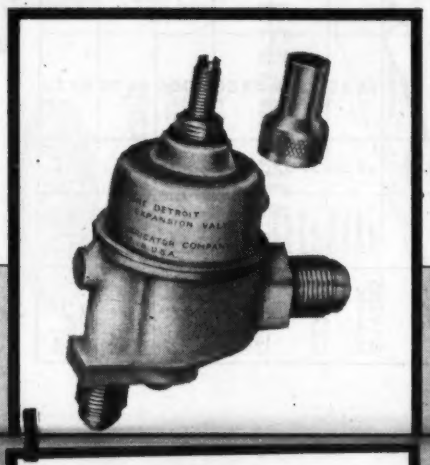
ANSUL CHEMICAL COMPANY
REFRIGERATION DIVISION, MARINETTE, WISCONSIN

DISTRIBUTORS FOR KINETIC'S "FREON 11," "FREON 12," "FREON 21," "FREON 22," "FREON 113" AND "FREON 114"

"Detroit" No. 672 and No. 892 Automatic Expansion Valve

QUICK RESPONSE
EXCEPTIONAL DURABILITY

"Detroit" Automatic Expansion Valves are compact, rugged, durable—quickly responsive to pressure changes and consistent in operation. They are designed for use on domestic and small commercial applications.

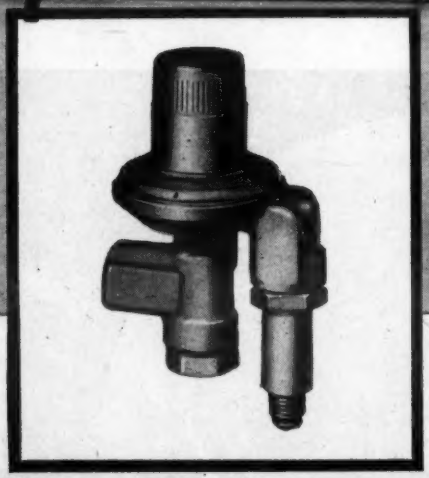


No. 672 "Detroit" AUTOMATIC EXPANSION VALVE

Bellows construction makes this valve extremely sensitive to pressure changes and consistent in operation. Designed for use on domestic and commercial applications where close control of evaporator pressure is required.

Some Outstanding Features

1. Constant suction pressure—constant motor load.
2. Duraflex bellows for wide range flexibility, long life.
3. Swivel type needle—no rubbing—no leaks.
6. Fluid dashpot eliminates chatter.
7. Delubaloy needle and seat for long wear.



5153

1. Constant suction pressure—constant motor load.
2. Duraflex bellows for wide range flexibility, long life.
3. Swivel type needle—no rubbing—no leaks.
6. Fluid dashpot eliminates chatter.
7. Delubaloy needle and seat for long wear.
8. Inlet strainer furnished with valve.
9. Two ranges: 25" vacuum to 25 lbs. and 5 lbs. to 50 lbs.
10. Inlet: ⅜" S.A.E. for ¼" or ⅜" liquid line.
11. Outlet: ¼" F.P.T. or ½" S.A.E.
12. Orifice: 1/32", 5/64", 5/32" or 7/32".
13. Capacities: .35 to 3.6 tons Freon-12; .66 to 6.6 tons Methyl; .58 to 5.8 tons Sulphur Dioxide.

No. 892 "Detroit" AUTOMATIC EXPANSION VALVE

Single diaphragm construction. Adjustable range 15" vacuum to 40 lbs. Inlet, ¼" S.A.E. Outlet, ¼" F.P.T. or ½" S.A.E. Capacity, ½ ton Freon-12; 1 ton Methyl or Sulphur Dioxide.

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DIVISION OF AMERICAN RADIATOR & STANDARD SANITARY CORPORATION

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LESS SPACE

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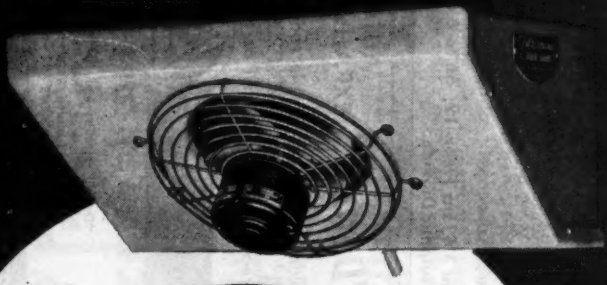
MORE COOLING



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Model C Ceiling Unit is only 8½" High. Refrigerated air is exhausted against the back wall, resulting in positive circulation to the bottom—Equipped with air purification—Peak performance for Reach-ins, Florist Boxes, Dairy Cases, etc. Made in 3 sizes to balance ¼, ⅓ and ½ H.P. compressors.

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BETZ CORPORATION

HAMMOND • INDIANA

How many valves in "THE COMPLETE LINE" ?

All standard, cataloged refrigerant control valves . . . not including strainers, special variations, or hundreds of special valves.

There is a valve in this great selection for
EVERY CONTROL NEED

- SOLENOID VALVES
- MULTI-OUTLET VALVES
- CONSTANT PRESSURE VALVES
- EVAPORATOR PRESSURE REGULATORS and other SUCTION LINE CONTROLS
- "THERMO" VALVES
- FLOAT VALVES
- FLOAT SWITCHES
- STRAINERS

Every approach to the control of refrigerants can be met with an ALCO VALVE from THE COMPLETE LINE

See your ALCO Wholesaler

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Designers and Manufacturers of Thermostatic Expansion Valves; Evaporator Pressure Regulators; Solenoid Valves; Float Valves; Float Switches.

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DFN

assures scientific control of MOISTURE-SLUDGE *and* SEDIMENT

DFN DEMOUNTABLE-TYPE DEHYDRATORS with replaceable cartridges. Straight thru and angle types. 1/6 hp. to 100 ton capacitities.

DFN STANDARD SEALED DEHYDRATORS factory charged and drying agent as desired. 1/6 hp. to 3 hp. capacities.

DFN MOISTURE CONTROL UNIT Portable, high-capacity drying and indicating unit. Wettest systems restored to operation in a few minutes. Dries to —60° dew point in a single pass. Operates at refrigerant temp. up to 150° F.

DFN—*the most complete line of* DEHYDRATORS, STRAINERS, FILTERS *on the market*

DFN products are made by *specialists* in drying, filtering and straining. Because more experience and more research go into DFN Products, you get more out of them in the long, efficient service—in clean, service-free operation of refrigeration systems.

Practically every problem of drying, filtering or straining can be met by the standard line of DFN products. If not, our engineers are at your service to work out special products to your needs. Always ask your wholesaler for DFN when ordering dehydrators, strainers or filters.

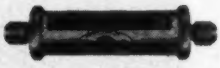
McIntire Connector Company
255 Jefferson St., Newark 5, N. J.

DFN MOISTURE INDICATOR

Tells quickly, accurately on the job when system is wet or dry. For Methyl Chloride and Freon.

DFN STRAINERS

- Demountable Type—straight thru and angle types
- Sealed Types
- "Pencil" Type Saves space; eliminates straps; steamlines your installation

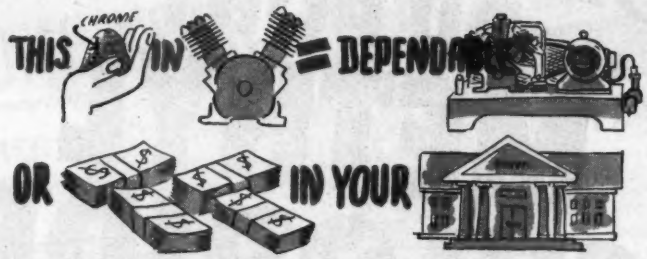


DFN PROGRESSIVE FILTERS

Designed to correct principle of coarse-to-fine filtering. Provide free flow of clean refrigerant. ½ hp. to 5 hp. ratings.

BRUNNER SINCE 1906 REFRIGERATION helps you serve better

Memo to Equipment Installers



That handful of chrome in the compressor casting can well be the starting point of more profits from sales and more complete customer satisfaction. This and many other technical reasons why Brunner condensing units have become "most wanted" will make interesting listening and your business more profitable. Spend a little time with a Brunner factory representative* who talks your language—knows your sales and service problems.

The recognized quality of Brunner units has forced greatly expanded manufacturing facilities—new buildings—more assembly lines—latest developments in precision machinery. It makes good sense to "check up" and have the advantages of Brunner acceptance by your trade.

*Write us. When would you like to have him stop in?

BRUNNER MANUFACTURING CO.
Utica 1, New York, U. S. A.

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AIR AND WATER COOLED MODELS
¼ HP. TO 25 HP.

To Meet Your Refrigeration Needs

"Artic"

DU PONT METHYL CHLORIDE

99.5% PURE
DRY • UNIFORM

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Purity . . . . . 99.5% Methyl Chloride
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Residue on Evaporation 0.01% by wgt. max.
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Color . . . . . water white, clear

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DU PONT ELECTROCHEMICALS

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Yes, every genuine Frigidaire Precision-Built Service Part carries a full year's warranty. That's mighty important to refrigeration service men.

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How can Frigidaire afford to offer such a warranty? By building replacement parts with the same precision methods, the same engineering skill and the same top quality materials as go into original equipment. And by subjecting them to the same rigid quality tests.

That's just one of many ways in which Frigidaire parts can help you in building a bigger, stronger business. And it's just one of many good reasons for standardizing on genuine Frigidaire Precision-Built Parts and Accessories.

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GENERAL MOTORS

For More Than 1,000 Models

No "modifying", no fussing, no delays when you use Cutler-Hammer "specific-fit" replacement control units which C-H not only catalogs but *has in stock* for more than 1,000 individual models of refrigerators built since 1925.

Here are just a few of the "specific-fit" replacement controls in the unequalled Cutler-Hammer line.

9502H417 C-H "specific-fit" for Briggs 1937 models

9521H95 C-H "specific-fit" for Copeland 1939 models

9502K387 C-H "specific-fit" for Norge 1932-33 models

9521H11 C-H "specific-fit" for Leonard 1937 models

9521H156 C-H "specific-fit" for Crosley 1940-1947 models

Smart service men are standardizing on Cutler-Hammer replacement controls. No "modifying", no fussing, no delays when you answer service calls with C-H "specific-fit" replacement control units. You take out the old, put in the new . . . and you are through! It's the easy, sure way to do the job *right* because Cutler-Hammer has manufactured such "specific-fit" units for more than 1,000 models of refrigerators built since 1925. And you'll also quickly see how the widely-known Cutler-Hammer name (advertised in The Saturday Evening Post, Time, Newsweek, American Home, Better Homes & Gardens, House & Garden, etc.) builds customer confidence and good will. The C-H refrigeration control catalog, as well as the items you need, are available through your authorized C-H refrigeration wholesaler. Do not forget, this C-H refrigeration control line includes the popular *general purpose* two-button replacement unit (Type 9502) which incorporates dependable motor overload protection. CUTLER-HAMMER, Inc., 1363 St. Paul Ave., Milwaukee 1, Wisconsin.

CUTLER-HAMMER
MOTOR CONTROL
C-H

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Brand new in materials and design, with latest type compressor assembly and capillary tube liquid feed. For exact replacement in older model Crosley refrigerators. Supplied with all accessories needed for complete installation. 4 year warranty. Complete line of units described in new Crosley Service Parts Catalog. Order your free copy now from your nearest Crosley distributor.

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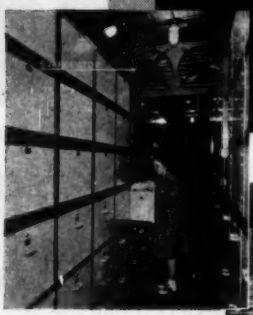
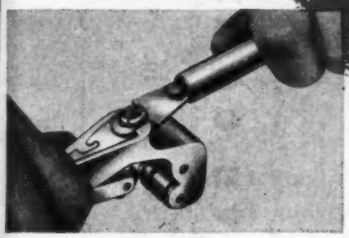


• *Write for Bulletin R124*

KRAMER TRENTON CO. *Trenton, N.J.*

New IMPERIAL Hi-Duty® TUBE CUTTER

Free Wheeling Ball Bearing Action Makes Tube Cutting Easier and Faster



Showing retractable reamer in operating position.

Illustration (actual size) shows tube cutter being used to remove a flare from a piece of tubing.

Never before has there been a tube cutter that makes it so easy to cut tubing quickly, accurately, squarely. Outstanding advantages, illustrated at right, truly make this the finest tube cutter!

Cuts copper, brass, aluminum, Bundy steel, block tin and lead tubing, hard or soft temper. Has broad range—cuts tubing ⅛" to 1" O.D. inclusive.

Extremely compact—overall length, only 4½". High strength, lightweight aluminum alloy body. Makes quick, clean, right angle cuts. Leaves no burrs or chips.

Here is a tool you'll be proud of. It is built to the quality standards which for years have made Imperial Tube Cutters the overwhelming favorites. Ask your jobber for it . . . and others in complete Imperial Tubing Tool Line. Ask for Folder 347.

No. 274-F Hi-Duty Tube Cutter for ⅛" to 1" O.D. tubing, inclusive. Net wt. approx. 6 oz. Price each...**$3.30**

THE IMPERIAL BRASS MFG. CO.

534 S. Racine Ave., Chicago 7, Ill.

IMPERIAL

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FITTINGS • VALVES • FILTERS • DRIERS • FLOATS • CHARGING LINES
TOOLS FOR CUTTING, FLARING, BENDING, COILING, PINCH-OFF AND SWEDGING.

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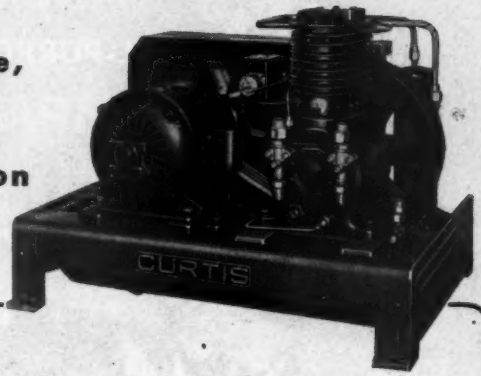

For years the name of Curtis on refrigeration and air-conditioning equipment has stood for highest quality, trouble-free operation. Curtis advantages include:

- Timken Bearings.
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- Pressure oiling.
- Finest materials—precision construction.
- Slow speeds—longer life.
- Wide range of sizes—air and water cooled.

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of Curtis Manufacturing Company
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B573C

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AMAZING! With standard attachments, you need only one Impact Tool to do all operations.*

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THAWZONE MANUAL
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Upper illustration: Standard Dome Cooler with air emitting in all directions.

Lower illustration: Two-way Dome Cooler with air flow limited to two directions.

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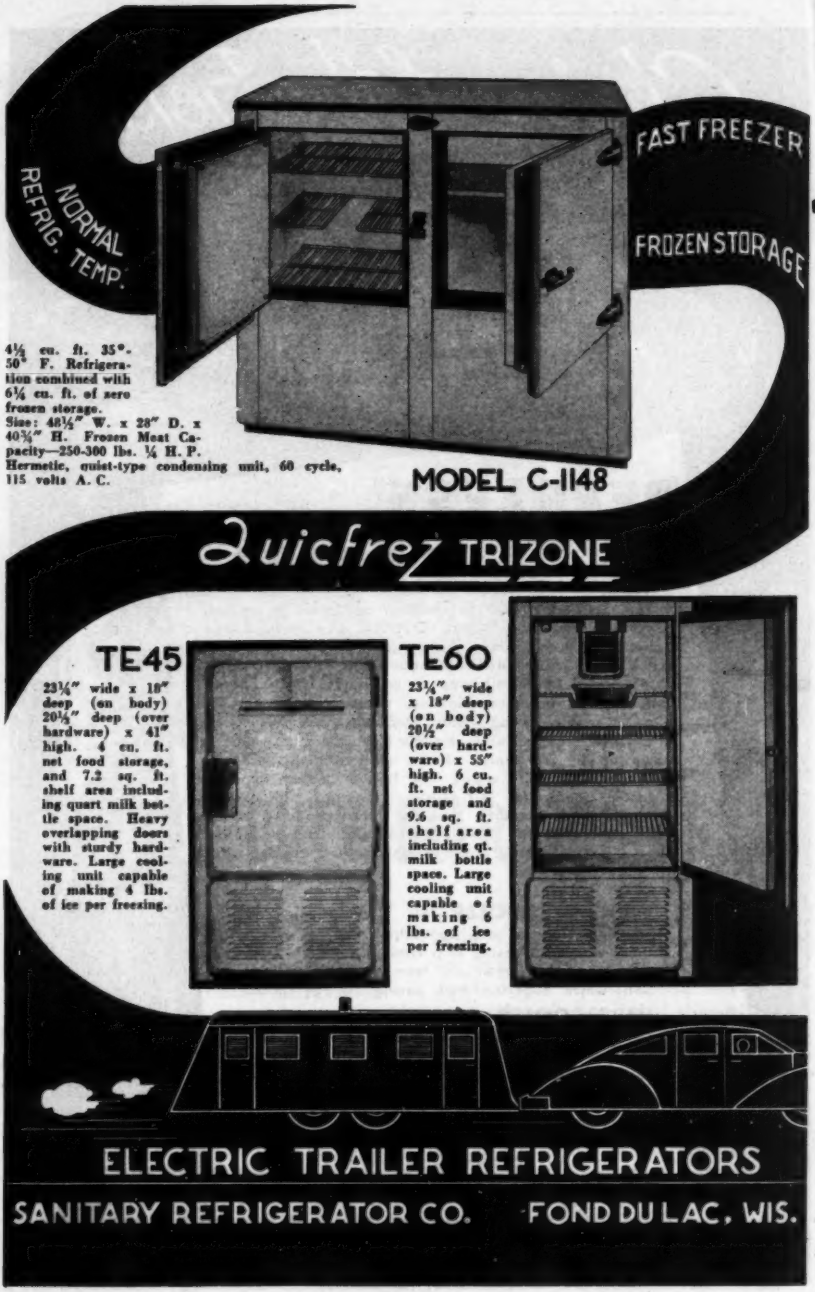
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Quicfrez TRIZONE
TE45
23¼" wide x 18" deep (on body) 20½" deep (over hardware) x 41" high. 4 cu. ft. net food storage, and 7.2 sq. ft. shelf area including quart milk bottle space. Heavy overlapping doors with sturdy hardware. Large cooling unit capable of making 4 lbs. of ice per freezing.
TE60
23¼" wide x 18" deep (on body) 20½" deep (over hardware) x 55" high. 6 cu. ft. net food storage and 9.6 sq. ft. shelf area including qt. milk bottle space. Large cooling unit capable of making 6 lbs. of ice per freezing.
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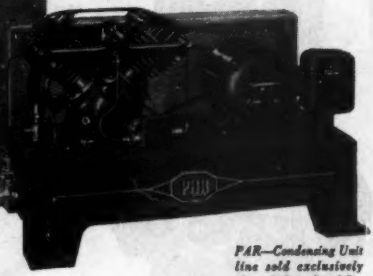
SANITARY REFRIGERATOR CO. FOND DU LAC, WIS.

Final testing on Lynch production Line assures maximum efficiency and performance of PAR condensing units



PAR—Condensing Unit line sold exclusively through Franchised Refrigeration Equipment Wholesalers!

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By Comparison — You'll Buy PAR

LYNCH CORPORATION

Par Compressor Division TOLEDO 1, OHIO U.S.A.

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Just slip a screw driver under the range spring and lift to release the tension. That's all you do to flush and clear the valve seat of foreign matter which may accumulate, especially in new installations. Here's another big advantage of Penn water valves which are protected from corrosion and sediment because water can't come in contact with the range spring or sliding parts.

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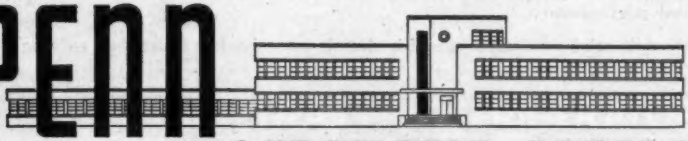
PENN



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OUTSTANDING FEATURES

1. Husky one-piece lower stem.
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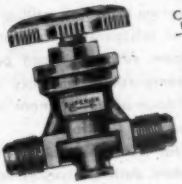
7. Individual wrench pads for tightening flare connections.
8. Unique sweat connections permit soft or silver soldering without removing internal assembly.
9. High quality, long wearing, seating insert.
10. No special tools required for servicing.

Superior ANGLE VALVES

CATALOG NUMBER	CONNECTIONS SIDE	CONNECTIONS BOTTOM	LIST PRICE EACH	NET WT EACH LBS	CODE WORD
	SAE Flare	Male Pipe			
104-4B	¼"	¼"	$5.00	.75	Lefon
104-4C	¼"	⅜"	5.00	.75	Lefro
104-6B	⅜"	¼"	5.00	.75	Lefus
104-6C	⅜"	⅜"	5.00	1.00	Legar
105-8B	½"	¼"	5.00	1.00	Legon
105-8C	½"	⅜"	5.00	1.00	Lejec
106-10D	⅝"	½"	6.00	1.25	Leked

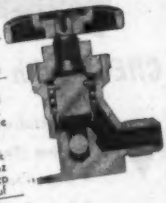
Superior LINE SHUT-OFF VALVES*

CATALOG NUMBER	CONNECTIONS	LIST PRICE EACH	NET WT. EACH LBS.	CODE WORD
	SAE Flare			
304-4	¼"	$5.30	.9	Lelm
304-6	⅜"	5.30	1.25	Lelot
305-8	½"	5.30	1.5	Lemaf
306-10	⅝"	6.60	1.5	Lemjo
	O.D. Sweat			
304-4S	¼"	5.30	.9	Lemuz
304-6S	⅜"	5.30	.9	Lenag
305-8S	½"	5.30	1.25	Lenek
306-10S	⅝"	6.60	1.5	Lenov



Superior BRANCH SHUT-OFF VALVES*

CATALOG NUMBER	CONNECTIONS	LIST PRICE EACH	NET WT. EACH LBS	CODE WORD
	SAE Flare			
304-4	¼"	$6.25	1.00	Lepem
304-6	⅜"	6.25	1.00	Lepuc
305-8	½"	6.25	1.50	Lepwe
306-10	⅝"	7.50	1.75	Leraj
	O.D. Sweat			
304-4S	¼"	6.25	1.00	Lesik
304-6S	⅜"	6.25	1.00	Lesoz
305-8S	½"	6.25	1.50	Lesep
306-10S	⅝"	7.50	1.75	Letul



Page

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BERYLLIUM COPPER POWER ELEMENT
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- *More Ranco Controls In Use*
- *Dependability*
- *Less Stock To Carry*
- *Greater Customer Satisfaction*
- *More Profit For You*

Ranco Inc. COLUMBUS 1, OHIO

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THE REFRIGERATION SERVICE ENGINEER

The National Magazine of Refrigeration Sales, Service and Installation

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SHORTAGE OF "FREON" ELIMINATED

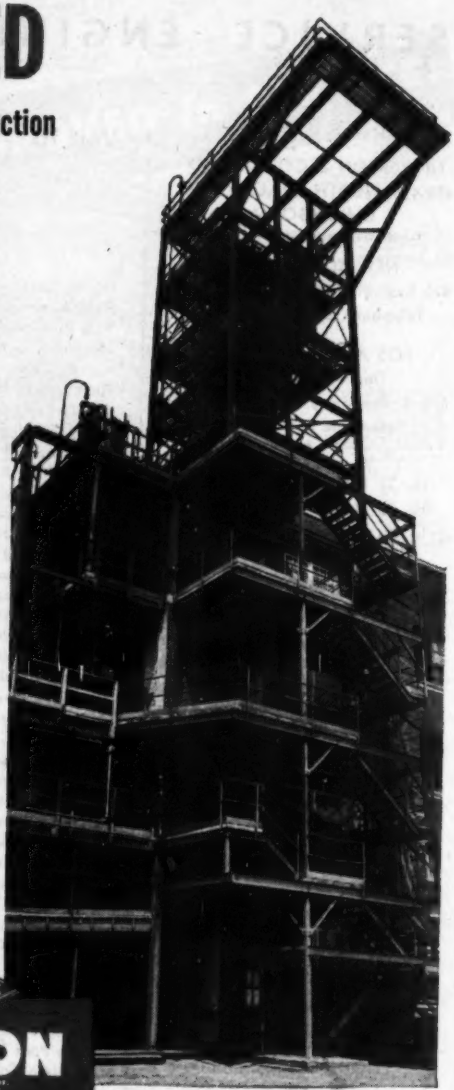
As New Plant Increases Production

Production of "Freon" safe refrigerants and propellents at the new Kinetic plant increases the supply approximately sixty per cent. This means that now there is plenty of "Freon" for every need. Users no longer have any reason for stock piling and thereby delaying the return of cylinders required for shipping.

The continued increase in the demand for "Freon" illustrates both an existing and a growing preference for these superior refrigerants. Today, they are used by all the best-known refrigerating equipment and insecticidal aerosol manufacturers in the United States.

The uniform purity and quality of "Freon". . . and the amazing dryness of these refrigerants (less than 10 parts of moisture in a million parts of "Freon") . . . help insure the long life and satisfactory operation of modern, compact refrigeration equipment.

In addition, because "Freon" refrigerants are nontoxic, nonflammable and nonexplosive, they are ideal for every type of commercial, industrial, and household refrigerating and air conditioning requirement. That is why —today—more and more buyers of equipment safeguard their investment by making sure that the installation is designed to utilize "Freon" safe refrigerants. Kinetic Chemicals, Inc., Tenth and Market Streets, Wilmington 98, Delaware.



View of the new Kinetic plant in East Chicago, Ind. Here, elaborate equipment installations, technical skill, engineering "know how," and laboratory control of the "Freon" syntheses combine to produce ample "Freon" for every user.

The need is still urgent for empty cylinders. Please return empties promptly.

KINETIC

FREON

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safe refrigerants

IN THIS ISSUE

THE article beginning on page 31 entitled "Field Service on the Servel Supermetic Units" is another of those service guides which have lasting value and therefore becomes reference material for future years. The article contains all the wiring diagrams, together with illustrated methods of testing the electrical equipment. While the story is lengthy to be contained all in one issue, it was felt the reader would prefer it this way.

W. L. COTTON is a new writer in these columns but is by no means new to the business of writing for trade publications. His series of article under the heading "This Business of Service", first of which appears on page 45, will be an amusing tale of the experiences of two partners in a service business. These experiences, however, will be based on those of the writer and other servicemen and will offer worthwhile suggestions to the reader. Although the series can be classed as light reading, they will in fact be educational.

"ELECTRICITY as Applied to Refrigeration" by Edward Dowis and appearing on page 48, presents some of the fundamentals preliminary to an understanding of motors and other electrical equipment used in refrigeration. This article is the first of a series which will go deeper into the subject of electric motors and electrical control devices such as relays, controllers, and electrically operated valves.

A. A. McCORMACK writes this month on 'An Engineer Looks at Patents." His article appears on page 52. The reader who has given thought to patenting his own ideas will find in this article a helpful guide to the most economical and best course to follow in developing and patenting his idea, what protection he may expect and some of the pitfalls he may avoid.

SERVICE Pointers on page 56 this month offer suggestions on building a drum rack for your car, getting oil into compressors with broken filler plugs and other service helps designed to make life more pleasant in the service field.

ONE of the questions in the Question and Answer department on page 58 provides a very complete method of calculating loads encountered in milk cooling. Another discusses beer cooling problems.

THE B9-1939 ASA code for mechanical refrigeration is undergoing a face lifting operation these days, which is intended to knock ten years off its life and make it completely modern. The work has progressed to the point where the first draft copies have been issued for members of the revising committee. E. T. Benson tells of the procedure, aims and work involved in an article appearing on page 60.

THE third in the series of regional educational shows sponsored jointly by RSES and REMA this year, will be held in Chicago next month. Because this one will be coupled with the RSES annual convention and NARC annual meeting, it is expected it will be the largest and best attended of the three. For the most information in the shortest time attend this meeting. Full particulars appear on page 66.

Jack Frost's strong arm

Better condensing units
through
JACK & HEINTZ
Mass Precision

One-piece construction makes the crankshaft of J&H Condensing Units forever strong and solid. There is nothing to work loose and cause trouble. This forged, alloy-steel crankshaft is hardened and precision-ground to exceptionally close tolerances and super-fine finish.

Here is another reason why thousands of users acclaim Jack & Heintz Condensing Units as tops for smooth, economical performance. Write for full information on ¼, ⅓ and ½ h.p. J & H Units.

JACK & HEINTZ JH PRECISION INDUSTRIES, INC., *Cleveland 1, Ohio*

Field Service On The Servel Supermetic Units

This information taken with permission from Servel, Inc. service manual.

THE Servel Supermetic line of condensing units are divided into two general groups. The first group, which includes the ¼, ⅓, ½ and ¾ hp. sizes, are hermetically sealed in a steel case but are equipped with service shut off valves at the receiver and at the suction side.

The second group includes the 1, 1-½, 2 and 3 hp. sizes and are enclosed in a cast case which is bolted together. Cylinder heads and valve plates are removable on these units and service valves are located at the compressor suction and discharge and at the receiver outlet.

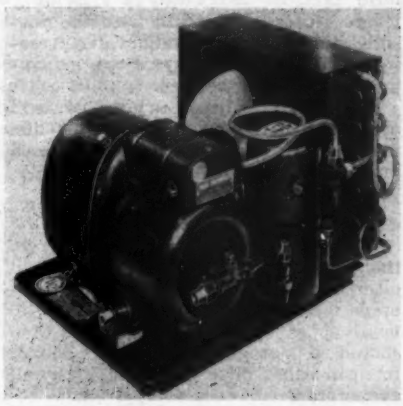
Some of the instructions to follow apply to both groups of units and to treat the most important points first, the problem of moisture gains first mention.

Moisture

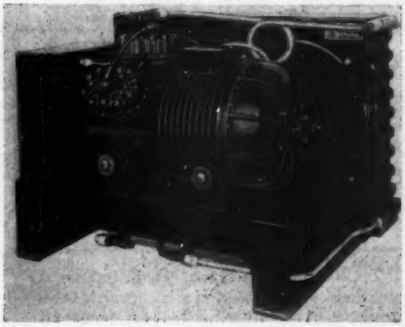
Moisture in a refrigeration system is being recognized as a source of equipment failure, not only because of interference with expansion valve operation, but because of the more damaging conditions of corrosion and sludge. These latter conditions are not immediately apparent, but the damages they cause are far reaching. Uninterrupted and long service life of equipment cannot be expected if moisture is allowed to enter or remain in a system.

The only satisfactory method of preventing the destructive effects of moisture in a refrigeration system is to remove the moisture with a good dehydrator of adequate size. It has been found that the addition of an anti-freeze compound to a Servel unit not only does not remove the destructive effect on the system but actually increases the rate of corrosion and sludge. The use of an anti-freeze in a Servel unit voids the warranty.

In many instances too much confidence has been placed in the dryer used in a refrigeration system. First it was believed that because a dryer had been installed that the system was dry. This is not always the case, however, as on most installations it is not known how much moisture is in the system nor how much moisture the dryer is capable of removing. The average one ton dryer generally removes about 20 drops of moisture under ideal conditions. Many dryers give up moisture when the surrounding temperature rises, thereby



Servel Supermetic Steel Case models made in ¼, 1/3, ½ and ¾ hp. sizes.



Cast case integral horsepower models made in 1, 1½, 2 and 3 hp. sizes.

lowering the amount held in the dryer.

For installations where there is a definite knowledge that moisture is in the system, large service dryers are recommended to insure adequate drying. With most dryers it is impractical to leave them in the system indefinitely as the major drying effect takes place in 10 days or less, so that there is nothing to be gained by leaving it connected for a longer period. There is always the hazard of the dryer releasing moisture back into the system in warm weather and also the possibilities of the drying agent dusting from the motion created by the passing of refrigerant through it. On freezer and low temperature installations adequate drying becomes even more necessary due to higher operating head pressure temperatures and lower temperatures in the coil, with the possible sludge formation and valve freezing. Large service dryers are recommended for such service.

Always remember a dry system will mean less call backs, longer unit life, more satisfied customers and increased profits.

Adding Oil

Supermetic units come charged from the factory with a sufficient surplus of oil to accommodate the needs of the average type of application. Should the oil level appear to be low, the first step should be to check the refrigerant charge to insure that oil is returning from all evaporators.

To check the oil level, the general procedure is as follows:

1. Install gauge on suction shutoff valve port.

Kind of Oil

Shell oil is used in all Supermetic units. It can be ordered under the Shell Oil Co. part number V-6071 and is known as Shell Northia oil number 33. It is available in standard size quart and gallon containers.

2. Close the suction shutoff valve by turning all the way to the right (clockwise) and let the power unit run until the gauge reads 1 lb. of pressure.

3. Stop the power unit and loosen gauge connection to release pressure in power unit.

4. Remove the bottom ⅛" pipe plug. The correct oil level is even with the bottom of this hole in the hermetically sealed units. The larger units have an oil sight glass and the proper level is half way up on the glass.

5. If the oil is below this level, add the proper amount. Replace plug and open the suction valve by turning counter-clockwise until the seat has been reached. Remove the gauge and replace ⅛" hex plug and seal cap.

Too Much Refrigerant

When refrigerant is charged into the system to the extent of filling the liquid receiver and partially filling the condenser coil, there is not sufficient condenser surface to permit extraction of the heat from the vapor being pumped into the condenser by the power unit. Therefore, the condensing unit capacity is reduced due to excess head pressures and may even cause damage to the power unit depending upon the extent of the overcharge.

If a unit has been overcharged, remove the excess liquid at the liquid level test cock until part liquid and vapor is expelled—which indicates a correct charge. When testing at the liquid level test cock be sure to open the valve sufficiently to determine whether liquid or gas is expelled.

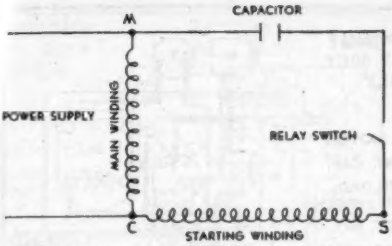
Checking Head Pressures

Many conditions can exist to cause abnormal head pressures, such as overcharge of refrigerant, air or noncondensable gases in the system, inadequate air circulation, recirculating hot air over the condenser, etc.

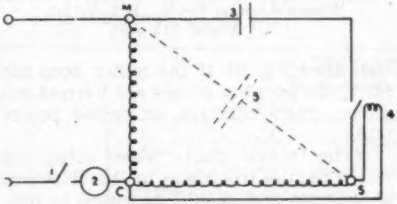
The connection located near the top of the liquid receiver has been provided for checking the high side pressure. This spud with a ⅛" P.T. thread or ¼" S.A.E. connector has a number 80 hole drilled in it which allows only a small amount of refrigerant vapor to escape during installation of the gauge.

The Electrical System

All single phase motors need some method of starting. This is accomplished by using a starting circuit that will create a magnetic pull on the rotor that

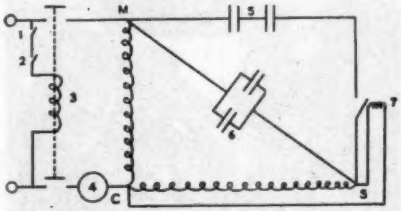


Basic wiring diagram for all capacitor type motors.



Schematic wiring diagrams for Servel power units.
(1/4, 1/3, 1/2 and 3/4 hp. units)

1—Low pressure control
2—Overload protector
3—Starting capacitor
4—Starting relay
5—Running capacitor (when used)
C—Common terminal
M—Main terminal
S—Starting terminal

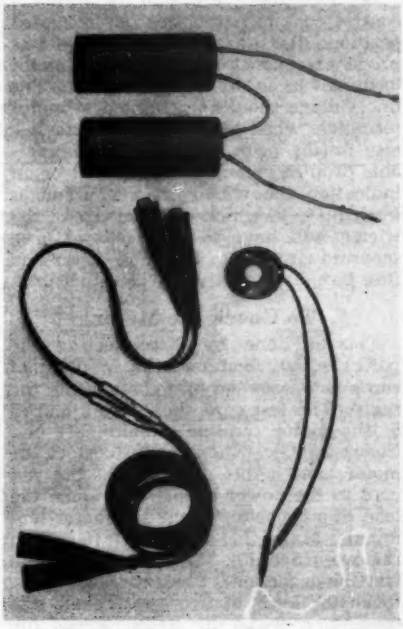


Schematic wiring diagram
Single Phase Intergral Hp. Units
(1, 1½, 2 and 3 hp. units)

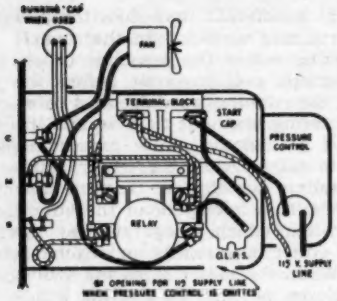
1—Low pressure control
2—High pressure control
3—Line contactor
4—Overload protector
5—Starting capacitors
6—Running capacitors
7—Starting relay
M—Main terminal
C—Common terminal
S—Starting terminal

occurs at a different time than the pull of the running winding. In the capacitor starting motor the capacitor causes the magnetic pull to occur before the pull on the running winding, thus causing a rotating magnetic field around the rotor of the motor. This causes the motor to start. After the motor starts the starting winding is not needed. Therefore, it is taken out of the circuit by a switch which is operated by the motor, either electrically or mechanically. When the motor stops the switch again closes, putting the starting winding back in the circuit.

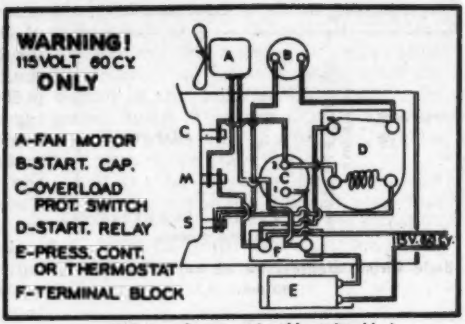
This basic circuit is used in all Servel Supermetic units equipped with single phase motors. The wiring diagrams on these pages incorporate this basic circuit as seen by tracing the wiring. To actuate the switch a relay coil is placed across the starting winding, both of which become energized when the motor reaches running speed, thereby opening the switch and removing the starting capacitor from the circuit. On the larger motors a running capacitor is used. It



Electrical test set used on all Supermetic models.



Wiring diagram for 1/4, 1/3, 1/2 hp. "A" Model 115 volt.



Wiring diagram for 1/4, 1/3, 1/2 hp. "C" Model 115 volt.

is connected between the power supply on the main winding connection and the starting winding connection.

All Servel Supermetic units are equipped with an overload protector between the power supply and the common connection on the motor.

Electrical Tests on Steel Case Models (A and C Models)

Be sure the thermostat or pressure control contact points are in the closed position; also be sure full voltage and proper frequency exists at the motor terminals as shown on name plate. The line voltage should be checked at motor terminals when the unit is first started, also during peak loads. If an appreciable drop in voltage exists, it will be an indication the wiring in the circuit is inadequate in which case the size of the wiring will have to be increased or a separate circuit run from the meter and fuse box direct to the refrigerating unit.

To Check the Motor

This is done by disconnecting the power supply and inserting a piece of cardboard between the contacts of the relay. The test cord should be attached to the motor terminals Main (M) and Common (C). When ready to start the motor, attach the other end of the test cord to the power supply and touch the lead of a capacitor across the motor terminals, Main (M) and Start (S), then remove. (See Fig. 1) Where a double starting capacitor is used, as on 230 volts, touch the leads of two of the same size capacitors, wired in series, across the motor terminals Main (M) and Start (S). (See Fig. 5) If the motor does not start, the possible causes are burned out motor, open winding, or seized power unit.

If the motor starts when using the test cord, the trouble is in the electrical accessories and should be tested as outlined in the following with the power supply disconnected:

It is important to make sure that the unit is not overcharged with liquid Freon in the condenser and that the crankcase of the unit is not completely filled with liquid Freon. These conditions may falsely indicate a seized unit.

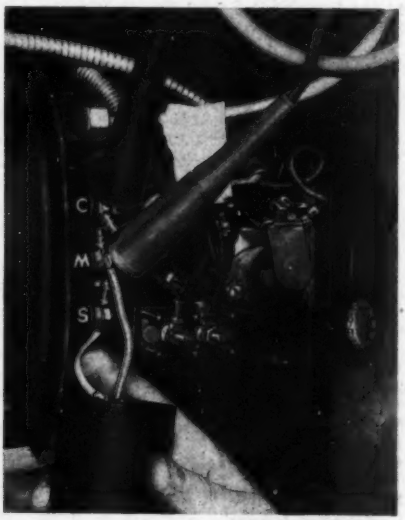
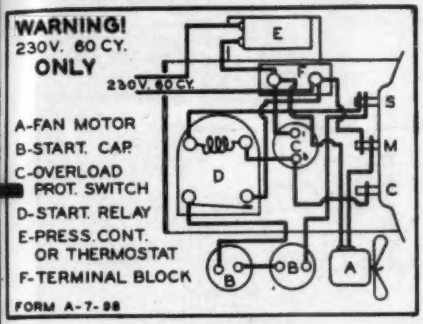
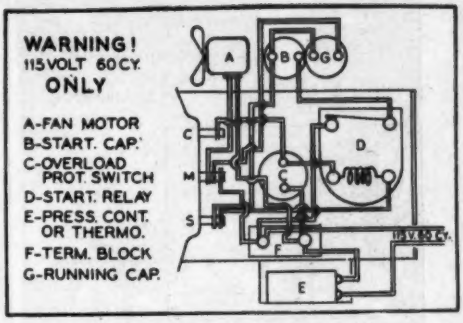


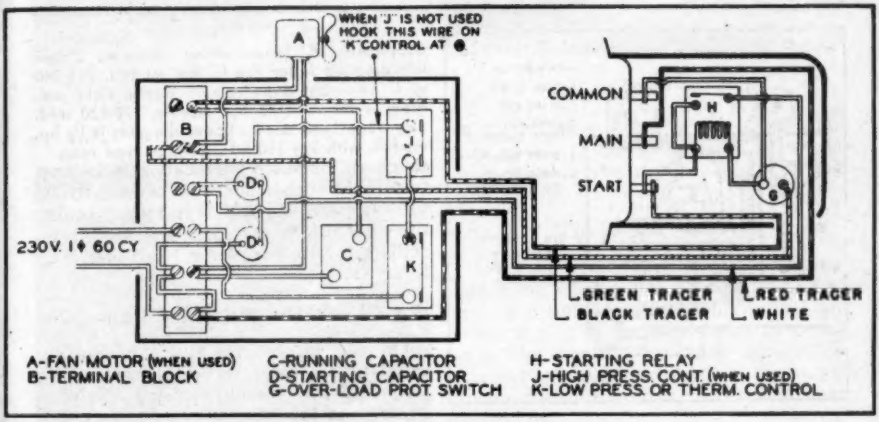
Fig. 1



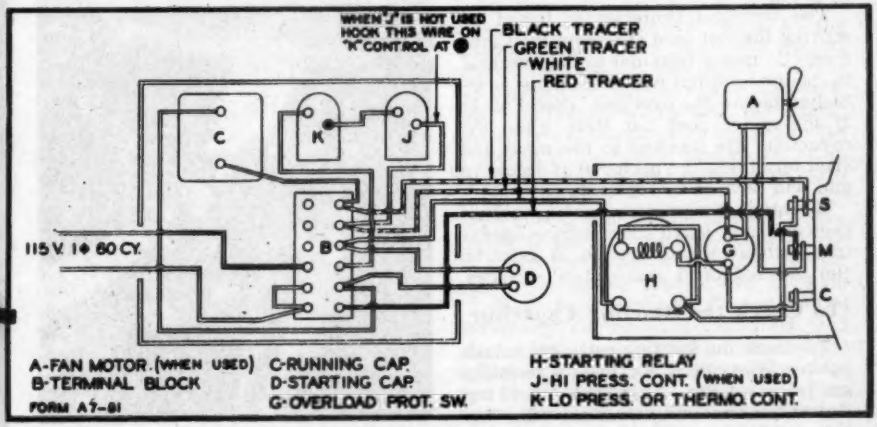
1/2 HP. 230 VOLT



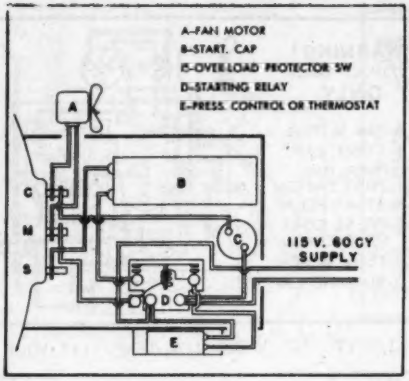
1/2 HP. 'C' MODEL LOW TEMP. 115 VOLT

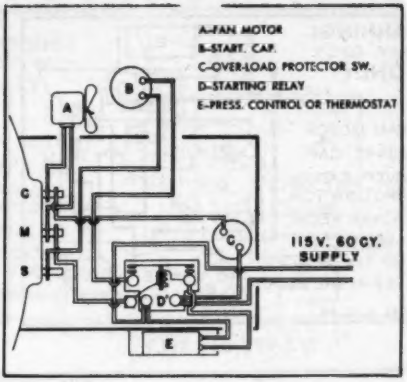


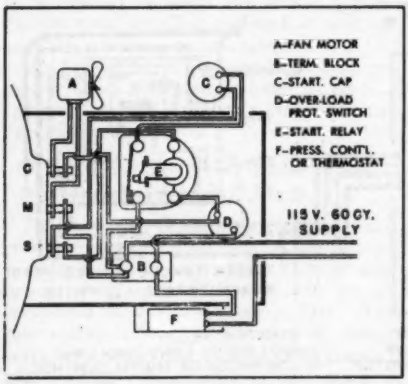
3/4 HP. MODELS 230 VOLT



3/4 HP. MODELS 115 VOLT







Supermetic "B" Model wiring diagrams. Upper left diagram is for the ¼ hp. models, 216-240 mfd. amperage type relay. Upper right diagram is for the 1/3 hp. models, 378-420 mfd. amperage type relay. Lower diagram is ½ hp. models, with 324-360 mfd. voltage type relay.

To Check Overload Protector

The overload protector is tested by moving the test cord clip from the Common (C) motor terminal to the overload protector terminal where the wire is attached before the overload. (See Fig. 2) If the motor does not start when the capacitors are touched to the main and start terminals, the protector is defective and will have to be replaced.

Warning—Never disconnect overload protector and leave the machine operating without any protection. A fusetron can be used until overload is replaced.

To Check the Starting Capacitor

To check the starting capacitor attach one test cord clip to a capacitor terminal and momentarily touch the other test clip to the remaining terminal. (See Fig. 3 for 115 V and Fig. 7 for 230 V) Then touch an insulated wire between the two terminals. If they spark on several trials, the capacitor is good. If it doesn't spark, the capacitor is open and will have to be replaced. (See Fig. 4 for 115 V and Fig. 8 for 230 V)

To Check the Running Capacitor

On the larger size units a running capacitor is used as it increases the power factor, thereby raising the efficiency and lowering the operating costs.

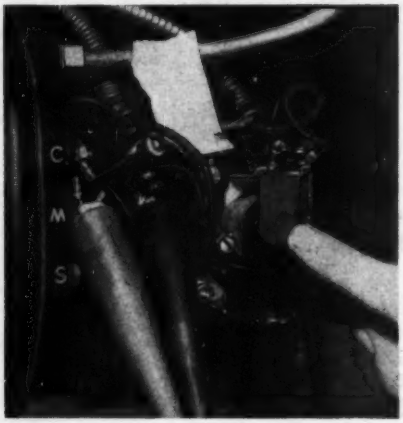


Fig. 2

Fig. 3

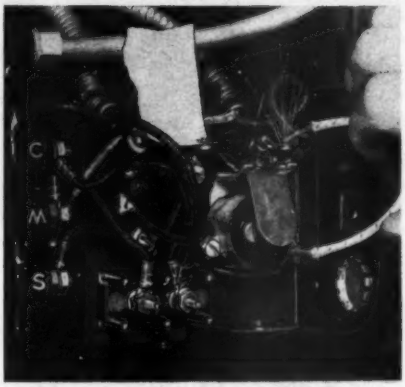


Fig. 4

To check the running capacitors, disconnect the lead from starting terminal (S) and start unit. Touch the lead to the terminal with the unit running. If the running capacitor is shorted, the unit will make a low rumbling noise and the fuse will blow. If the capacitor is open, there will be no change in the sound of the unit. If the capacitor is all right, the unit will run quieter. Another check is to place the test cord across the capacitor terminals (See Fig. 6) and check for a spark as was done on the starting capacitor. The lead must be disconnected from the starting terminal (S) for this check. Otherwise, current would flow through the running and starting windings.

Fig. 5

To Check Relay

(Without removing from accessory box using a test cord) The starting relay is a very simple mechanism and has but one function to perform which is to engage the starting capacitor across the starting and main terminals of the motor during the split second required to start the motor.

If there is an open circuit in the relay holding coil, the unit will start but will cut-out on the motor overload in a short time and continue to start and stop at short intervals, as the inoperative relay causes the motor to run on the starting windings too long drawing excessive current, thereby causing the motor protector to cut-out on the motor overload and will in many instances blow out the capacitor.

To check, first disconnect the power supply to the unit. Second, place a piece of cardboard between the relay contact points, attach the clips of the test cord on the motor terminals "C" and "S" as designated on the wiring diagram, and plug it into the electrical outlet. If the actuating arm of the starting relay does not go down, hold the test capacitor on the motor terminals for a longer period or press down. (See Fig. 2) If it does not

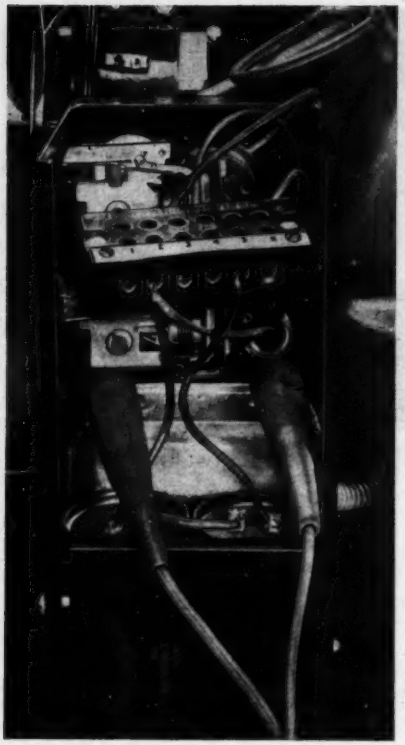


Fig. 6

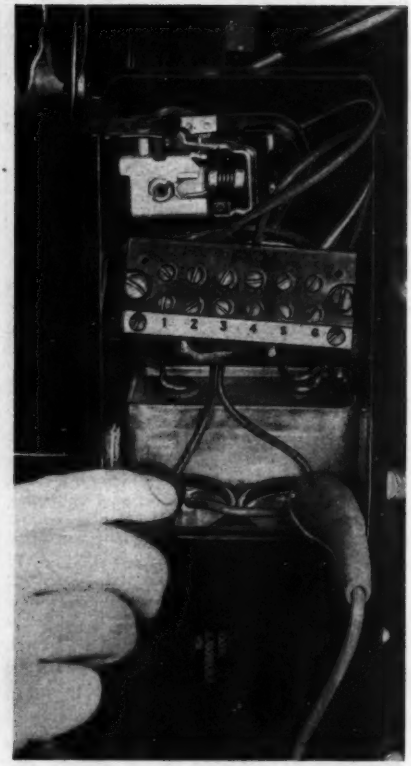


Fig. 7

go down, either the relay coil is open or the relay is the wrong size. In either case replace with the proper size.

Note: The accessory box must be replaced. If it is left off, trouble can be experienced at the relay contact points due to dust (or insects) causing the contacts to arc and stick.

To Check 2 and 3 Lead Fan Motors

The fan motor is of the single phase shaded-pole type and should run when the power unit motor operates. If the power unit motor runs and the fan fails to start, check the fan to see if it turns freely. If it turns freely and does not lack oil but still does not run, it must be replaced. (See wiring diagram for hook-up).

Warning: Oil the fan motor every six months with a few drops of household lubricant, except sealed fans. These do not need oiling.

Electrical Tests—"B" Model (¼ and ⅓ hp. Sizes, 115 V)

Disconnect power supply and the wire from motor terminal "S". Attach test cord and touch capacitor terminals to Main "M" and Start "S as in testing all other models. If motor starts, the unit is O.K. and the troubles are in the electrical accessories.

To check overload and capacitor, use method used on all other models as noted previously.

To Check Relay

If all other electrical accessories test O.K., the trouble is probably in the relay. The amperage operated relay is obsolete and should be replaced by a

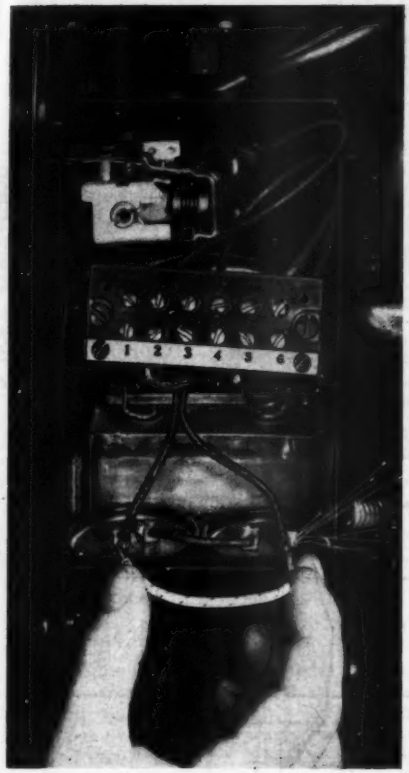


Fig. 8

voltage relay, electrical assembly Part No. 1461-83 for the ¼ hp. units and Part No. 1461-69 for the ⅓ hp. units.

Electrical Tests on Cast Case Models (Single Phase)

It is important that before the electrical tests are made, electrical power is supplied to the unit. This can be determined by testing the voltage at the line contactor. Check should be made for blown fuses, open switches, and loose or broken connections.

To Check the Motor

This is done by disconnecting the power supply and the black wire connecting the starting and running capacitors to the line contactor terminal (See Fig. 14.). The test cord should then be attached to the motor terminals Main (M) and Common (C) (See Fig. 9.). When ready to start the motor, attach the other end of the test cord to the power supply and where a single starting capacitor is used on the unit, touch the lead of a single 432-480 mfd. capacitor across the motor terminals, Main (M) and Start (S), then remove. Where a double starting capacitor is used, touch the leads of two 432-480 mfd. capacitors, wired in series, across the motor terminals Main (M) and Start (S). If the motor does not start, the possible causes are burned out motor, open winding, or seized power unit.

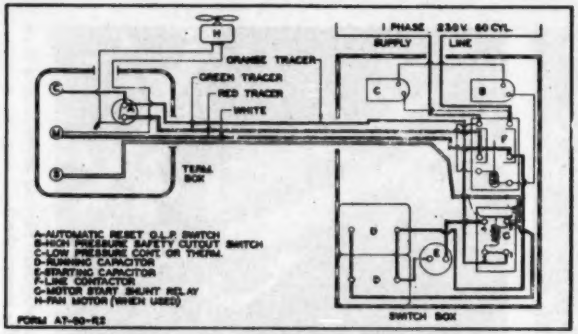
It is important to make sure that the unit is not overcharged with liquid Freon in the condenser and that the crankcase of the unit is not completely filled with liquid Freon. These conditions may falsely indicate a seized unit.

If the motor starts when using the test cord, the trouble is in the electrical accessories and should be tested as follows, with the power supply disconnected.

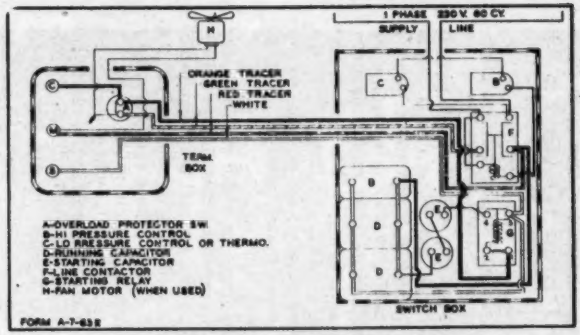
To Check Overload Protector

The overload protector is tested by moving the test cord clip from the Common (C) motor terminal to the overload protector terminal where the green wire is attached. (See Fig. 10) If the motor

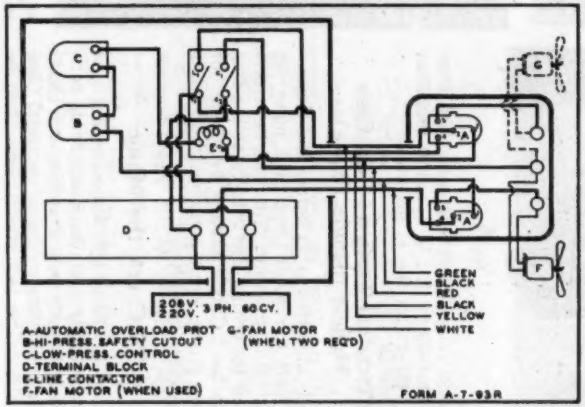
Fig. 9—Showing test clips on common and main terminals for motor check.



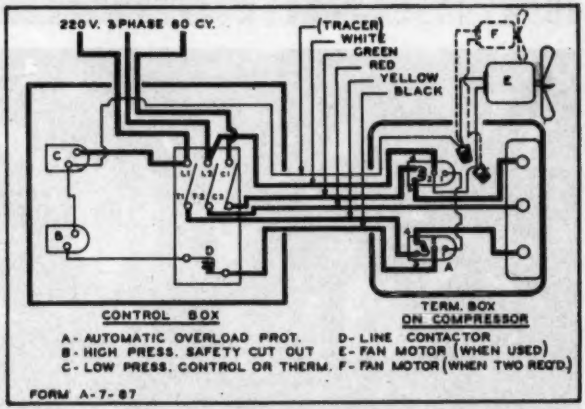
1½ AND 2 HP. SINGLE PHASE
SINGLE STARTING CAPACITOR



1½ AND 2 HP. SINGLE PHASE
DOUBLE STARTING CAPACITOR



1½, 2 AND 3 HP. THREE PHASE
2 POLE CONTACTOR



1½, 2 AND 3 HP. THREE PHASE
3 POLE CONTACTOR

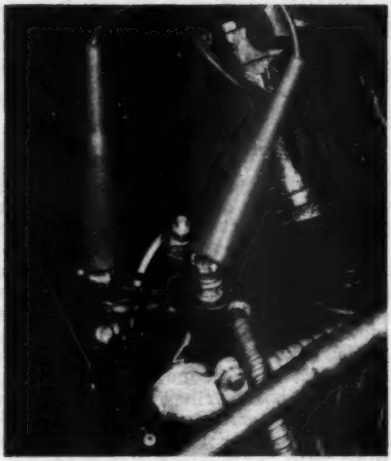


Fig. 10—Test clips in place for overload protector test.

does not start when the capacitors are touched to the main and start terminals, the protector is defective and will have to be replaced.

To Check Line Contactor

The line contactor is tested by placing the test cord clips on the contactor coil terminals. If the contactor does not close, the coil is defective and will have to be replaced. To test the contact

Fig. 11—Touching test clips across starting capacitor.

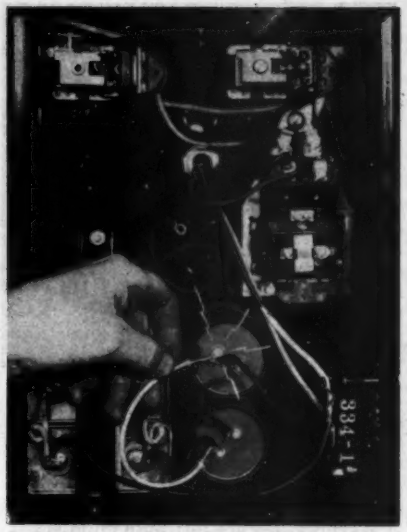


Fig. 12—Checking for spark in starting capacitor check.

points, attach one clip to terminal L1 and the other clip to one terminal on the voltmeter or tester. The other terminal of the voltmeter should be attached to terminal T1 and the contactor closed by hand. Voltage will indicate if the points are O.K. This same test should be repeated on terminals C1 and C2.

To Check Starting Capacitors

Power Units with Single Starting Capacitor. The single starting capacitor must be tested on 115 volts. This is done by removing one test clip from the power supply and grounding it to the power supply box or conduit. The starting capacitor is then tested by touching the test clips across the terminals (See Fig. 11) for not more than one second, and then connecting the terminals together with a short piece of insulated wire. (See Fig. 12) If they do not spark after several trials, the capacitor is defective.

Power Units with Double Starting Capacitor. The double starting capacitors can be tested with 230 volts from the power supply. The starting capacitors are then tested by touching the test clips across their terminals (See Fig. 11) for not more than one second, and then con-

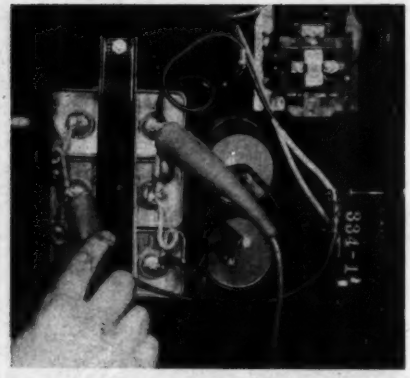


Fig. 13—Position of test clips for running capacitor check.

necting the terminals together with a short piece of insulated wire. (See Fig. 12) If they do not spark after several trials, the capacitors are defective.

Warning: Do not test individual capacitors on 230 volts as they are 115 volt sizes. Starting capacitors can be used up to 15% over-sized with no appreciable effect on the unit operation. However, they should never be under-sized.

To Check Running Capacitors

The running capacitors are tested in the same manner as the starting capacitors although the spark will be weaker due to the smaller mfd. rating. (See Fig. 13) A shorted or grounded running capacitor will blow a fuse in the test cord. The unit will operate temporarily without running capacitors, but it is to be remembered that the amperage is higher and the unit hums without it and, therefore, it should be replaced as soon as possible.

To Check Starting Relay

With the black wire connecting from the starting and running capacitor at terminal 2C on the line contactor disconnected, start the unit with the test cord and test capacitors. Touch the black wire, connecting from the running and starting capacitors to terminal C2 on the line contactor. (See Fig. 14) If the relay is defective, the motor will make a low rumbling noise as the relay is not disconnecting the starting capacitors, thus keeping them in the circuit, and will have to be replaced.

After the starting relay test is completed, replace the black wire to terminal C2 on the line contactor.

This completes the electrical tests for single phase units.

Electrical Tests on Cast Case Models (Three Phase)

An additional single wire test cord with clip on each end is required to be used in conjunction with the two wire test cord.

To Test Three Phase Units (3 Wire Contractor) disconnect the power supply and connect the single clip to the center motor terminal and the two wire clips to the outside motor terminals. The motor should start. If the motor does not start, the cause is either a burned out motor, a seized power unit, overcharge of refrigerant, or the crankcase completely filled with liquid Freon.

If the motor does start, then the trouble is either defective overload protectors, or line contactor. This is assuming that there are no loose or broken connections in the wiring.

To Test the Line Contactor Coil

Remove center clip from motor terminal then place the two wire test clips on the two coil terminals. If the con-

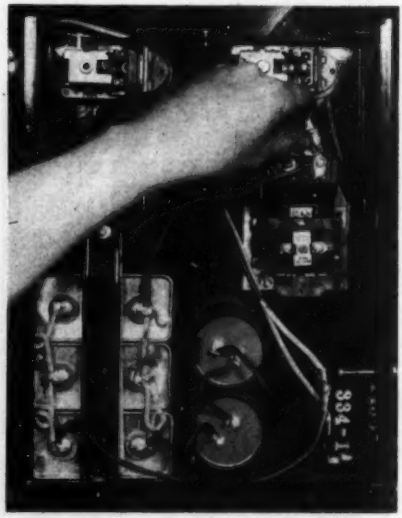


Fig. 14—Showing black wire (removed for motor check) in place for starting relay check.

tactor does not close, the coil is defective and will have to be replaced.

To Test the Contacts of Line Contactor

After all the foregoing tests have been made, remove test cords and turn on power supply. If line contactor does not close, raise it to the closed position by hand. If contacts are clean and operative, the power unit will start. Normally when the power supply is connected, the line contractor will close itself. If it does not, either the pressure switches are not closed or they are defective or there is an open circuit in the wiring.

To Test Three Phase Units (2 Wire Contractor), use same instruction shown above except "To Test Overload Protectors" which is as follows:

To Test the Overload Protectors on the 2 and 3 Wire Contactors

The overload protectors can be tested by turning on the power supply and placing a voltmeter or tester from terminal 2 on one protector to terminal 2 on the other protector. If there is a voltage reading, there is power to the protector, and the test can be continued. Where there is no voltage, check for loose connections, broken wires, etc.

Next place the voltmeter across terminals 1 and 2 on one protector. If there is a voltage reading, the switch on the protector is open and the protector will have to be replaced. Repeat this test on the second protector. Test terminals 3 and 4 on each protector. If there is full voltage reading on either protector, that protector has an open coil.

To Test Discharge and Suction Valve Plate Assembly

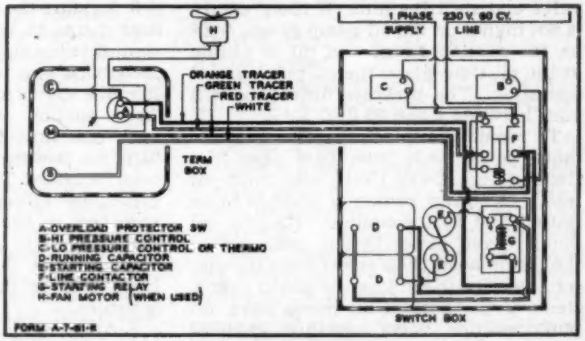
To test for a leaking or broken discharge valve, install a compound gauge at the service port of the suction shutoff valve, and close the valve. If the suction pressure is not over 30 pounds, we can proceed with the test. With higher suction pressure, it is advisable to run the unit and reduce the suction pressure to a lower point. With the unit stopped, note the suction pressure. Allow the unit to stand for at least 2 minutes. If there is no appreciable rise of pressure on the suction gauge, the discharge valves are holding. If the pressure on the suction gauge does rise rapidly, one or more of the discharge valves are leaking.

To determine which valve plate is leaking, it is necessary to isolate and test each valve plate individually. This is done by first running the unit until the crankcase pressure is reduced to about 1 lb. Disconnect power.

At this point, the discharge shutoff valve should be closed. A blank flange gasket should be placed under the flange of one of the discharge tube flanges on the 4 cylinder models, and under two of the discharge tube flanges on the 6 cylinder models; thus isolating the one being tested from the others. By opening the discharge shutoff valve, if pressure rises on the suction pressure gauge, this will indicate the valve plate being tested is leaking. By moving a blank flange gasket to another discharge tube flange, a second discharge valve plate can be tested and repeat once more if the power unit is a 6 cylinder model.

If discharge valves are found to be leaking, replace the complete valve plate.

Compressor suction valves cannot readily be tested with most service equipment. The method of drawing a



1 HP. SINGLE PHASE

vacuum on the crankcase was practical with the one cylinder household compressor but is not usable with multi-cylinder units. A wattmeter and pressure charts can be used for this test but as most servicemen are not so equipped other methods must be devised.

In most cases, a broken suction valve will cause a pounding noise in the head of the power unit. Where this is not true, the only thing that can be done is to visually inspect the valves.

To Repair or Replace Oil Pump

When the overload protector cuts out on an installation, one possible cause is the oil pump not operating. To check this condition, install a gauge at the suction shutoff valve and close the valve, pumping the unit down to about 1 lb. pressure. Release the crankcase pressure by loosening the pressure gauge. At this point remove the service plug at the oil pump on the compressor end of the power unit and install a second pressure gauge. Again tighten the pressure gauge at suction shutoff valve and open valve and start the unit. If the pressure is not higher on the oil pump gauge, than on the suction gauge and oil is visible at the oil sight glass, the oil pump is not operating. The pressure difference will vary between 1 and 20 lbs.

To repair or replace the oil pump remove power unit from base (See "To Remove the Power Unit') and drain oil into a clean dry container if oil is to be reused and seal container. Remove oil pump cover plate, loosen and remove the piston head (ball yoke) from the piston. Be sure to not lose the piston shims. Remove the bottom oil pump plug, oil pump suction valve asembly, cylinder sleeve and piston assembly. Push wire into oil relief valve, located slightly above the crankshaft. Make sure that the passage is open and the spring is not broken. Check oil pump parts to make sure they are clean and not damaged. Reassemble by reversing above method. The oil pump suction valve should be carefully checked to see that it seats properly and the spacing shims must be reinstalled in the same manner as removed. After the oil pump is reinstalled, reconnect power unit to base. (See "To Replace the Power Unit.") After the power unit is reinstalled, check the oil pump pressure as outlined above.

To Replace the Power Unit

1. Place power unit on unit base, brace to align for installing mounting bolts.

2. Replace suction and discharge shutoff valves and pressure control connections.

3. Remove ⅛" pipe plug from the discharge shutoff valve. Connect charging drum with compound gauge to suction shutoff valve.

4. Rewire motor terminals and fan connections. See wiring diagram in switch box and instruction sheet with replacement power unit.

5. Install low pressure gauge at oil pump test port.

6. Short out low pressure control and turn on power. Draw vacuum for 2 minutes. In some cases the oil pump will not operate on a vacuum when the power unit is first installed. If this is the case, turn unit off, purge crankcase, and start the unit without attempting to draw any further vacuum.

7. Turn off power and open charging drum valve to purge unit. Close charging drum valve and again draw vacuum.

8. To start the unit install a high pressure gauge in service port of discharge shutoff valve and open valve all the way then back one turn for gauge readings. Remove short from low pressure control. Open suction shutoff valve and turn back one turn for gauge readings and turn on power. If the power unit has been repaired in your shop, there are great possibilities that moisture has been absorbed in the motor windings. It is not practical to bake out the power unit. Therefore, it is necesary to install a large dryer in the system to remove this moisture.

9. Allow unit to operate for 15 minutes. check head, suction and oil pressures. If head pressure is too high, turn off power and purge receiver, either by liquid level test cock, if no liquid appears, or by removing the head pressure gauge. After purging, restart unit and add refrigerant until liquid shows at liquid level test cock.

10. Close suction shutoff valve and pump unit down to 1 lb. pressure. Release pressure at suction port. Remove gauge from oil pump port and replace ⅛" plug. Open suction and discharge shutoff valves all the way. Remove gauges, replace plugs in service ports, and replace valve stem caps.

This is the first of a series of stories on the experiences of servicemen, told in an easy-to-read, fictional style which will be both amusing and educational. The author of the series is a refrigeration service engineer and electrician of more than 20 years' standing who has written a number of articles for trade publications.

His stories, while using fictitious names and scenes, are based on his own and other service engineers' actual experiences. A number of worthwhile suggestions and instructions on field service and business management will be brought out in this series.—Editor.

Emergency Service

BILL Winters came in the back door of the Acme Electric and Refrigeration Shop, kicked the door shut, and slammed his tool box down so hard it made the windows rattle.

Tom Clark, his partner in the business who was working at a bench putting a seal in a compressor, just kept right on tightening cap screws nearly a minute before he spoke. "Find anything wrong with Mrs. Edwards' refrigerator?" he asked.

"Heck, no!" Winters snapped, "but it's a wonder the motor wasn't burned out. You should see the place she has put it. She had her kitchen remodeled, you know, new cabinet and everything. She had the carpenter build a place for the refrigerator, wasn't satisfied with building a place in the cabinet for the refrigerator that shut off most of the air, she had the carpenter case around it practically air tight. 'So mice couldn't get in behind the refrigerator'."

"Well, my guess is you didn't convince her that the refrigerator wasn't at fault, "Clark said. "Does she want us to take it back?"

"No—she did at first, until I told her we would, then she acted sort of reasonable and asked me if I couldn't fix it some way."

"What did you figure out?" Clark asked.

"Well, luckily the back porch is on the other side of the wall where the refrigerator sets. Mrs. Edwards agreed to have an opening cut and a louvered ventilator set in, so the unit can get some air."

The conversation was interrupted by a man entering the shop from the front. "I'm looking for a refrigerator man," he said.

"What can we do for you?" Clark asked.

"Fix my refrigerator, I hope. My name is Walker, John Walker. I own the Hill-Top Resort about forty-five miles from here. Got a bunch of guests coming tomorrow, already bought supplies including fresh meat. It won't keep."

"What kind of a refrigerator is it?" Winters asked.

"It's a walk-in box, I believe you call them, not very big, maybe four by six feet," Walker told him.

"Won't it run?"

"Sure it'll run; runs all the time, but it won't get cold. Never been run since it was overhauled. This is the first time I've needed it since," Walker explained. "A man from Denver took the motor and everything to his shop and overhauled it. Runs nice, but won't freeze."

Bill Winters slammed his tool box down, plainly disgusted, as he came in the back door. His partner, Tom Clark, continued to work on a compressor a few minutes before he spoke. "Find anything wrong?" he asked.

"Did he test it out when he brought the unit back?" Clark asked.

"He ran it a little while, but didn't have time to wait for it to get cold. Then he shut some valves and told me to leave them closed until I wanted to use it. I opened the valves before I turned on the switch," Walker added.

"What kind of gas does it have in it?" Winters asked.

"Don't know," Walker replied. "All I know is it stinks like all getout and burns your eyes."

"How's the road?" Winters started to pick up his tool box.

"I can make it most any time in my jeep," Walker said, "but it's pretty rough."

"Well, I guess about all I'll need is my tool box, maybe a drum of gas, and I guess I'd better take along my 'hell box.' It has a bunch of fittings and a few odd parts in it." Winters gathered up the articles as he talked. Walker helped him load them in the jeep and they took off for the hills.

"Pretty rough" as applied to the road to Walker's place was a masterpiece of understatment. After they turned off the highway into the sideroad, Bill was busy hanging on to the seat.

It was almost eleven o'clock when they left Middleton and after one when they reached the resort.

"Let's eat," Walker suggested.

"Suits me," Bill quickly agreed.

Starts Checking

After lunch, Winters set to work. He found, as suspected, a fairly old sulphur job with a low side float. He attached the gauges and started the machine. The pressure on the low side was about sixty pounds before the machine was started, indicating sufficient gas. Suction pressure dropped quickly to about eight pounds and would go no lower. Bill tapped the float valve header thinking the valve was probably stuck open, but it didn't do any good.

After about ten minutes running, the suction line got cold all the way to the compressor, even colder than the evaporator in the box.

"What do you find?" Walker, who was watching Bill work, asked.

"Well, it looks like either not enough refrigerant or a leaking float valve," Bill told him. "I'll try adding a little gas and see what happens."

Adding more gas didn't help; if anything, it made matters worse. The suction pressure would't pull down as low as before and about the only frost that showed up at all was on the crankcase of the compressor.

"Looks like a bad float valve," Bill said, as he picked up a wrench and started to close the receiver valve to pump the machine down.

While Bill was working, Walker watched him with considerable interest and tried every way he could to help. Usually he only managed to get in the way. He took out in a hurry, though, when a little SO_2 was allowed to escape.

The compressor was in good condition and pumped the gas into the receiver fairly fast. When the machine had been running a few minutes with the receiver valve closed, Walker went into the box and felt of the evaporator, as he had been doing every few minutes.

"It's getting cold," he announced. "I believe you've got it fixed. There's frost on the coils."

"It'll start to get warm pretty soon," Bill told him. "In fact, I'm going to heat it a little right now," he added as he began lighting a blow torch.

When the evaporator began to warm up slightly, Bill played the flame from the torch around on the pipes and coils to drive the gas out.

Rusty Cap Screws

When the gauge held it just a little above zero pressure, he disconnected the lines to the evaporator, then using a socket wrench, started to remove the cap screws holding the float valve assembly. The cap screws were badly rusted and corroded. Not a one of them would turn with pressure that should have turned them easily. Bill laid the wrench down and went to get his torch to try heating the cap screws a little.

"What's the matter, can't you turn them?" Walker asked and picked up the socket wrench. He placed the socket on a cap screw and heaved. It turned all right, that is the head turned, the rest of the cap screw stayed. "I broke it," Walker said.

"I'm afraid they'll all twist off before they'll come out," Bill told him.

"Then we would be up against it. It would be one heck of a job drilling out eight cap screws. Then we would have to go back to town to get some more and maybe a tap. Besides," Bill added, "I'm not even certain I can do anything with the float valve after I get it out without ordering some new parts."

"You mean you can't fix it?" Walker's voice almost had tears in it.

"Let's see," Bill scratched his head, "maybe I've got an expansion valve in my 'hell box' that'll work."

Bill pawed through his "Hell box" looking for the answer to his problem.

There was no suitable valve in the box. All he could find was a little automatic for a household box and a large thermostatic valve for freon and it was defective.

Bill pawed around in the box, laying out parts of valves, switches, and fittings. Among other things he laid out a thermostatic switch with an eight foot capillary. He started to replace the things in the box. Suddenly he stopped and looked at the eight foot capillary. "It might work," he said, speaking his thoughts aloud.

"What might work?" Walker asked with interest.

"I'll show you," Bill replied.

Using a file, he nicked the capillary tube and broke it up close to the bellows and did the same up close to the bulb. He then cut the quarter inch liquid line up close to where it went into the float valve. He wound the capillary in a tight spiral, leaving about two inches straight at one end and twenty-four inches at the other. The short end was soldered into a piece of quarter inch tube just long enough for a flare nut to connect to the fitting on the float valve header. The long end of the tube was soldered into the liquid line.

"What'll that do?" Walker wanted to know.

"Make this outfit work, I hope," Bill told him. He opened the receiver valve and listened. Liquid gurgled through the capillary tube and hissed in the evaporator. When the gurgling had just about stopped, he sarted the machine, at the same time watching the low side gauge. The pressure started coming down rapidly at first, then more slowly.

It's getting cold," Walker announced jubilantly. "I believe it's going to work."

The tube could have been slightly longer or a bit smaller, but it worked fairly well and the box got cold. Bill adjusted the control, setting the differential as wide as possible to avoid a tendency to short cycle.

"How does that little piece of pipe make it get cold?" Walker asked as Bill gathered up his tools and prepared to go.

I'll try to explain how a capillary tube works as we jolt along towards home," Bill said.

Bill didn't slam his tool box down as he entered the back door this time and he was wearing a smile as he turned to his partner. "You know, Tom," he said "getting an appreciative customer out of a bad jam can do a lot for a fellow's morale. Take this fellow Walker, for instance . . ."

Oh, well, you have read the story.

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Correction

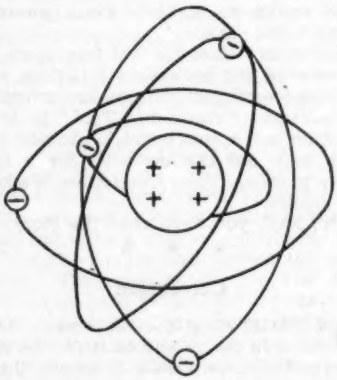
ON PAGE 57 of the September, 1948 issue in the article entitled "Servicing the Universal Cooler Hermetic Unit" the statement was made, "An undercharge of refrigerant is indicated when the suction line is cold or frosting at the compressor assembly." Through an error in printing a line was omitted in this statement and it should read, "An undercharge of refrigerant is indicated when the cooling coil is not completely frosted. An overcharge of refrigerant is indicated when the suction line is cold or frosting at the compressor assembly."

Electricity *as applied to* Refrigeration

An explanation of basic electrical principles as they apply to the design, maintainance and operation of refrigeration equipment.

BY EDWARD DOWIS

THE electrical equipment of the modern refrigeration or air conditioning system is so completely integrated with the mechanical, that a working knowledge of electricity is essential to a complete understanding of the refrigeration cycle as presently applied. The refrigeration industry has presented problems so peculiar to itself that electrical manufacturers have developed special lines for refrigeration work: Included, among others, are thermostatic and pressure motor controls, special motors and windings for sealed units, motor starting relays, solenoid and motor operated valves and several lines of test equipment.



Electrical effects are believed to be caused when the electrons or negative charges move out of their regular orbits in the atom.

Some of the component parts of the electrical system are manufactured by electrical firms catering exclusively to the refrigeration industry, some by manufacturers who have supplied the industry with other than electrical products and some by electrical manufacturers who have departments serving our industry. There is also a varied line of general electrical merchandise which can be applied to refrigeration applications when we understand the possibilities and limitations of such equipment and what makes it operate.

What Is Electricity?

Many practical men have been content to learn how electricity works, without being too much concerned with what it is. The trouble with this approach is that, without some conception of its nature, it may be impossible to predict how it will behave in any unfamiliar application. Research, up to the present time, indicates that electricity is a form of energy caused by the movement of tiny particles, called electrons. All matter is presumed to be composed of tiny molecules which, in turn, consist of two or more atoms. The atom is believed to consist of a positively charged nucleous, around which negative charges of electricity rotate. These electrons can be caused to move from their regular orbits under certain conditions, producing the various effects which we attribute to electricity. When a body has an excess of these negative charges or electrons, it is said to be negatively charged. When it has less than its normal number, it is said to be positively charged. When a negatively charged body is connected with a positively charged one the excess of negative charges pass along the connecting medium to the positively charged body:

Thus, the movement of electrons through a circuit is believed to be from negative to positive poles or terminals.

All electrical texts are written with the assumption that electricity flows from the positive to the negative pole through the conductors connected to the poles of generators or batteries. Thus, while it is believed the electrons move in the opposite direction to what we normally consider the direction of current flow, this can be accepted as an interesting scientific fact without invalidating all the published literature on the subject.

How Electricity Is Produced

While our knowledge as to the exact nature of electricity is incomplete, we have certain conditions which will produce it and very definite laws governing its behavior. The known methods of producing electrical energy are:

1. Friction between dissimilar materials.
2. Maintaining different temperatures at the junction points of dissimilar metals.
3. Chemical action.
4. By magnetic action.

The first method is interesting but has little, if any practical value. It is observed when combing the hair with a dry rubber comb, that electrical discharges can be heard between comb and hair and that the hair, if dry, will refuse to lay down because, having like charges they repel each other. (In humid weather this may not be observed because the moist air conducts the electricity to the earth as rapidly as it is generated). Frictional electricity is produced by the friction of belt driven machinery but the charges are usually carried away through the metal frame of the machine. Trucks carrying flamable liquids may have dangerous charges built up by the friction of the liquid in the tank and as these charges can not be carried away through the rubber tires a metal chain is suspended from the tank to ground to prevent charges from igniting the vapor. Because this method of producing electricity is inefficient and the high voltage and low volume produced is difficult to control, it has no commercial value.

The second method is used in certain types of thermometers in which temperature is indicated by the current or voltage produced when the junction points of a series of dissimilar metals are kept at different temperatures. Fig. 1 shows how a series of iron and copper wires (called a thermocouple) could be combined in series (called a thermopile) and voltage and current produced by heating one side and cooling the other. The current so produced would be usable but this method is very inefficient and used only in certain types of thermometers and pyrometers.

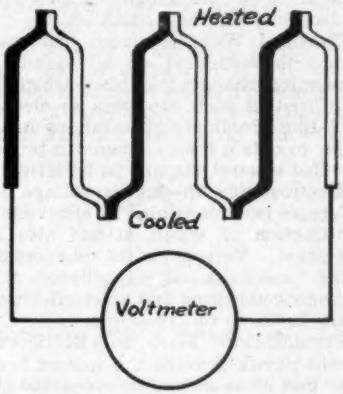


Fig. 1—Thermocouple used as thermometer.

Electricity by chemical action, is that produced by batteries. When chemicals react with different metals in a solution a difference of voltage is set up between them which will cause useful current to flow and the chemicals to change their state. When the battery is discarded or the chemical and metals replaced, it is called a primary battery as, for example, the dry cell used in flashlights and signal work. When the battery can be restored to usable condition by sending a current through it from another source, it is called a storage battery. It does not store electricity, as such, but puts the battery in condition to produce electricity.

Magnetic generators, driven by steam, gas, oil or water-power supply the bulk of electrical energy. These generators, as well as the motors which consume much of the electrical energy, operate upon the relatively simple and well known laws of magnetic induction, attraction and repulsion. These will be discussed in detail later.

Effects of Electricity

The passing of an electric current is always accompanied by two or more of the following effects:

1. Heating: Electric current flow is always accompanied by the production of heat. The quantity of heat is directly proportional to the rate of current flow and the resistance of the circuit. The quantity of heat produced is 3.41 Btu. per hour for each watt consumed.
2. Magnetic: Motors and generators depend upon the magnetic effects of electricity for their operation.
3. Chemical: When an electric current is sent through acid or salt solutions, chemical changes take place which are utilized in such processes as electroplating, decomposing solutions in order to obtain their elements, a process called electrolysis, and in batteries.
4. Electrostatic: An electric voltage difference is accompanied by electrostatic attraction or repulsion and also induction. Various radio phenomena, the operation of capacitator start motor condensers and other effects are attributed to this principle.
5. Physiological: When an electric current passes through the human body, or that of an animal, nervous and circulatory disturbances take place which may be fatal if the current or voltage is sufficiently high. Rays cast by certain types of lamps have a sterilizing effect and destroy certain bacteria and are so used in many refrigerated spaces. The medical profession makes use of electro-physiological effects in the diagnosis and treatment of disease.

The Magnetic Field

The force which makes possible, our wide use of electricity, is magnetic. Our earth is a huge magnet and will attract one end of a similarly magnetized steel needle towards its North magnetic pole and the other end toward it's South pole. Only a few substances can be magnitized and, of these, only iron and steel are commonly used. Certain kinds of steel, once magnetized, retain their magnetism for long periods and are called permanent magnets. Soft iron is very easily magnetized by being brought in contact with, or near to a magnet but looses its magnetism as soon as the magnetizing force is removed.

Every magnet has a North and South pole, so named because, if freely suspended, they would point in these directions. A North pole of a magnet will repel a North pole of any other magnet and attract a South pole. A fundamental law of magnetism is

Like poles repel and unlike poles attract.

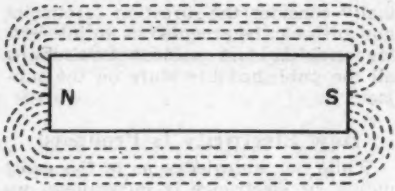


Fig. 2—Lines of force around bar magnet.

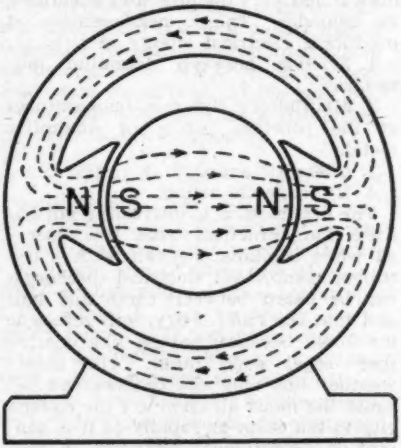


Fig. 3—Magnetic path through motor or generator.

It will be seen that the earth's magnetic South pole is near the north geographic pole as it attracts the North pole of the compass, which is a magnetized needle.

Every magnet has a field surrounding it through which it exerts its force and lines of force are said to exist in this field, extending outward from the north pole, through the field and inward at the south pole extending from south to north within the magnet and north to south in the external field. Fig. 2 illustrates the field of a bar magnet. Because

lines of force can pass through iron much more easily than air, the magnetic path in electrical machinery is composed almost entirely of iron, as illustrated in Fig. 3. Any magnetic material within a magnetic field, such as the armature, becomes magnetized by induction because of the lines of force extending through it as indicated in Fig. 3.

Electromagnets

When an electric current passes through a wire, a magnetic field is set up around the wire, the lines of force extending in the direction of the fingers of the right hand when the current flow is indicated by the thumb as illustrated in Fig. 4. When current is sent through several wires carrying current in the same direction, as in a coil, these lines of force surround the entire group as illustrated in Fig. 5. The right hand rule for finding the polarity of an electromagnet is that when the fingers are wrapped around the coil in direction of current flow, the thumb will point in the direction of the north pole.

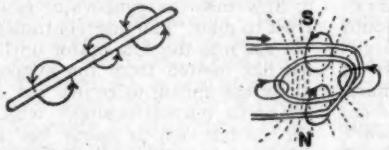


Fig. 4—Lines of force around current carrying conductor.

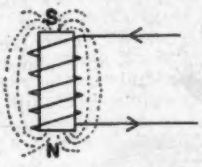


Fig. 5—Lines of force through a coil.

Volts - Amperes - Ohms

Three factors largely determine the characteristics of electric current flowing in any circuit. There must be a pressure, called electromotive force, expressed in volts. The volt is the unit of pressure. The ordinary dry cell has an electromotive force of about 1½ volts. The lead storage cell about 2 volts or three cells in series 6 volts. Most lighting circuits are supplied at approximately 115 volts. Th volt is most simply defined as the electromotive force necessary to transmit 1 ampere through 1 ohm of resistance. In order to understand this definition thoroughly, we must have some conception as to the meaning of the terms ohm and ampere.

All materials offer resistance to the flow of electricity, as piping offers resistance to the flow of water. The more the resistance the more voltage or pressure is required to transmit a given quantity of electricity per hour. The unit of measurement is the Ohm and is defined as the resistance through which 1 volt will force 1 ampere of electric current. Common values of resistance are:

100 watt lamp, 110 volt, about 101 ohms.
1000 feet No. 10 copper wire 1 ohm.
1000 watt soldering iron, 110 volt, about 12.1 ohms.

The ampere is the name given to the unit rate of current flow. It is the amount of current which a pressure of 1 volt will force through a resistance of 1 ohm. The 100 watt lamp referred to, will draw about .91 ampere, the 1000 watt soldering iron about 9.1 amperes, a ¼ h.p. motor, 110 volt a.c., about 4 amperes at full load and perhaps 15 to 20 amperes while starting. The starting motor for a car or truck may require as much as 200 amperes.

Ohm's Law

In any circuit, unaffected by counter voltage and self induction:

Amperes will always be volts divided by resistance in ohms.
Volts will be ohms X amperes.
Resistance in ohms will be volts divided by amperes.

This will apply to an entire circuit or any part of the circuit. This is the fundamental law of electric current flow and, together with capacity and induction, will control the current flow in any circuit. One or two examples will illustrate the application of this law:

1. What is the resistance of a relay coil which causes a voltage drop of 2 volts when carrying 16 amperes?
   A. $2 \div 16 = \frac{1}{8}$ ohm.
2. What voltage will be consumed by a

refrigerator cord having a resistance of ¼ ohm when carrying a starting current of 20 amperes?

A. ¼ × 20 = 5 volts.

3. How much current will be consumed by a strip heater having a resistance of 4 ohms if connected to a 110 volt circuit?

A. 110 ÷ 4 = 27.5 amps.

Thus it can be seen that an electric current can be set up by any of the methods of producing a voltage or pressure and that the current will flow through a circuit, the amperage being determined by the voltage and resistance. Just how these principles are applied to the actual generation of direct and alternating current and the operation of motors, together with an explanation of armature and stator windings, will be covered in an article to follow.

(To be Continued)

An Engineer Looks At Patents

By Alexander Ascham McCormack

I AM going to make a million dollars. There's no doubt about it, I'm going to make a million dollars. From now on, my only work will consist of endorsing royalty checks. It's in the bag. How do I know? Uncle Sam says it is. I have been granted a patent.

I was quite exasperated when my patent attorneys required eighteen months to obtain the patent and then charged me two hundred dollars, but they assured me that it is a sound patent and what's two hundred dollars out of a million?

Let's say that my patent covers the invention of a novel way to defrost an evaporator. Since we require a means for knowing when the evaporator needs defrosting, I conceived the idea of hinging the evaporator and biasing or balancing its weight with a spring. Then, as the ice accumulates, the evaporator becomes heavier and eventually overbalancing the spring, it swings downward on the hinge and closes a switch.

The closing of the switch energizes a solenoid which increases the spring pressure in the water valve causing the unit to operate at a very high head pressure. An automatic "blow-off" valve opens due to this high head pressure and allows the hot discharge gas to flow into the evaporator causing the frost to melt. The unit continues to flow hot gas into the evaporator until enough ice has melted from the evaporator to allow the spring to return the evaporator to its normal position, which opens the switch, which opens the solenoid, which allows more water to flow through the water valve, which closes the hot gas by-pass and we are automatically back to normal operation. I have invented a means of automatically defrosting an evaporator.

Patent Attorney's Function

Let us assume, and the assumption will generally be true, that in obtaining a patent for me, my patent attorneys did just what they are in business to do, namely, to obtain a patent for me on my invention. It is not the function of the patent attorney to judge the commercial value of my idea. That is my own problem and the fact that I came to them and was willing to invest two hundred dollars was their reason for believing that I was convinced of the commercial value of my conception. They studied my idea; they searched the patent files on the prior art and obtained for me a patent. My idea was novel, would theoretically work and I was granted a good basic patent.

But no one wants my idea. It isn't practical. It would forever be defrosting at the most inopportune time. For example, just when the Mrs. is having

the girls in for bridge and the freezing compartment is full of frozen delicacies. The engineers at the commercial evaporator company point out that frost would form around the hinges and freeze the evaporator tightly in the normal position and all the ice that the evaporator could hold would never break the hinges loose. The chief engineer of the compressor manufacturer doesn't like the idea either because when the water valve setting is raised to cause the defrosting, the unit will shut off on the high pressure cutout instead of opening the by-pass. After having spent time and money visiting these engineers, I now realize my idea is worthless.

But Uncle Sam can't do this to me. I have been granted a patent on a worthless idea. I will sue the government, or write the President a letter, or maybe both. No, I am wrong. When Uncle Sam grants me a patent, he doesn't worry about the commercial worth of my idea. My letters of patent merely says that Uncle Sam believes that I have made an invention as described in my list of claims. Its degree of worth is up to me. So I shouldn't blame my patent attorney nor the patent system for having granted me a worthless patent. I have only to look into the mirror and I will see who is at fault.

Engineer Helps

It would be a superhuman job to ask the Patent Department to pass judgment on the commercial worthiness of an idea. Let us say that the Patent Department had decided that my idea should not be allowed a patent because it was not commercially practical. Then a clever engineer built the hinges far enough away from the evaporator, or interposed insulation so that no frost formed on the hinges. He limited its application to those jobs where the timing of the defrost cycle was not important. He used "Freon-22" and, due to its rapid change in pressure with temperature, was easily able to obtain a setting on his by-pass valve between that of the water valve and that of the high pressure cutout.

He next designed his by-pass valve out of copper brazed stampings. He used a non-critical spring and a synthetic rubber seat, resulting in a low cost reliable valve. He had a practical answer to all of the objections and my idea, upon which a patent was denied because of its impracticalness became commercially desirable.

So, you see, the function of the patent is to protect me so that I can develop it to commercial usefulness. By long experience, it has been proven that the only sound course is to charge the patent system with the responsibility for determining novelty and to charge the engineering profession with the responsibility for determining usability.

The whole patent structure is built primarily to protect my idea. However, our government is socially conscious and I cannot indefinitely refuse the use of my invention. Also in the case of infringement, the government recognizes the interests of the investor, of the factory employee and of the buying public by giving to the party who has unwittingly infringed and who has a going factory whose very existence is threatened by this infringement an opportunity to work out a reasonable compromise.

Make a drawing of your idea. Have it witnessed —then send it to yourself by registered mail.

Let us suppose I have conceived an idea that I think might be patentable. Do I rush to a patent attorney? Not necessarily. I make a clear sketch of my idea. It doesn't have to be fancy but it should contain a brief description of how it will work. This I sign and date, writing out both my name and the date in full. Next, I show my idea to someone who will both understand it and who is trustworthy. Then he writes on the drawing—"Explained to me and understood by me" and signs his name

and dates it. This whole business of making the sketch and the signatures might well be made in duplicate.

The original sketch I seal in an envelope and send it to myself as a registered letter. I do not open this letter, but keep it as proof of the date of my conception of the invention. If at any time I desire to file for a patent on this idea, I then turn this letter over to the patent attorney.

I now have a year's time to reduce my idea to practice—that is, to make a working model. I should record my making of the model, should write down the things I had to do to make it work, and should have the signature of the first person who saw it in successful operation. Every paper should be carefully dated and signed.

By waiting until I have reduced my idea to practice before making application for letters of patent, I am able to sort out the ideas that prove valuable and my attorneys can obtain for me a patent that will more completely protect my invention. Also, it will stop me from making an application for patent on a nonworkable idea. An idea that seemed wonderful at inception may well prove to be silly when I do a little actual work in making a model.

Ready for Patent

By the end of one year after reduction to practice, I must have made application for letters of patent. This should be done by a competent patent attorney. I should allow him plenty of time to complete his application. I must work closely with him and remember he knows lots more about patents than I do. It's his business to know.

Upon receipt of my application, the Patent Department will issue a patent application number. This is not a guarantee of a patent. However, if I wish to try and sell my invention at this time, I can tell my potential buyer about my idea, can show him the model, and can let him read my patent application. At this point, I have good protection, but I am quite likely to find that the buyer will hold off until my patent is actually granted. However, most companies move painfully slow in accepting an invention, so I probably will have plenty of time in which to get the patent granted even if I take my idea to them when I have only an application for patent.

After the Patent Office has had my application for what seems to be an impossibly long time, I am likely to be floored when my attorney tells me that all of my claims have been disallowed. My patent attorney is serene. He carefully prepares new claims, changes the wording of the rejected claims, argues that the examiner was wrong in rejecting claims 16, 21 and 26, or whatever claims he thinks should have been accepted, and the battle is on.

Eventually, the patent is granted. A good attorney will ask for more in his application than he expects to have allowed. He expects the examiner in the patent office to reject some of the claims so they spar around until my patent attorney and the examiner are in agreement. If he is a good patent attorney, he shall obtain as broad a protection of my idea as possible.

I should choose my patent attorney with the same care and technique that I would use in selecting a doctor. If he is a good patent attorney, he will be reasonably prosperous, he will be busy, and will not be overly anxious to promise me a basic patent in 90 days. If he is a good patent attorney, he will not be interested in taking a slice of the new business as a return for his work. On such a basis, he is quite likely to starve. I must remember that he is primarily a patent attorney and is not a sales analyst, an engineer, a financier, or a promoter.

By far and away, the majority of patent attorneys are substantial, honest citizens. Since they do sell such an intangible product and one which the layman does not understand, there unfortunately exists those leeches who obtain a quick and limited patent that offers no real protection. I can best spot these leeches by their over-willingness to assure me that my idea must be patented, that it has untold possibilities, and that I must move up fast before someone else beats me to it.

Who Is the Inventor?

Who is the true inventor? Suppose John Jones or The Acme Manufacturing Company or Refrigeration Service, Inc., has hired me to develop a method of defrosting. Because they asked me and

paid me to develop such a method, does not mean that they are the inventor. If the conception of the novel way to accomplish defrosting is my own idea, I, and I alone, am the inventor and the patent will be granted to me as the inventor no matter who pays the bills. I can assign the ownership of the patent to anyone and if I accomplished a patent while working on an improvement for which I am being paid, the courts will decree that my patent must be assigned to the party who paid me to make the improvement.

If I conceive an idea of a way to defrost a refrigerator while I am servicing refrigerators for Refrigeration Service, Inc., and I have no agreement to assign such ideas to my employer, it is quite probable that the courts would judge that the ownership of the invention was mine alone. It is easy to see that there are plenty of border-line decisions and the advice of an honest patent attorney should be sought before I spend money developing or patenting my invention if there is a question of doubt as to my full ownership of the idea.

Suppose that my friend, Bill Smith, and I are discussing the need for automatic defrosting and between us we conceive the novel method described earlier in the article. If we jointly conceived the idea, we are joint inventors and both of our names will appear on the patent issue as inventors. Three or four people can be joint inventors of one invention but, in general, the greater the number of people that list as joint inventors, the weaker the patent and unless it can be well established that it is a joint invention, it is best to name a single person as the true inventor of the idea.

After I have been granted a patent, I have seventeen years' protection. Many good patent attorneys will drag out the date of issuance of patent to extend its life. If they can keep its issuance pending for say two years, they feel that they have given me ninteen years' protection instead of seventeen years. Then, too, as soon as it is issued, the patent is published and smart operators will study my patent and copy the idea if they can change it just enough to get around my patent. Before it is issued, they have no idea what I have and they cannot copy what they don't know exists.

Patent Protection

We have discussed at length the obtaining of a patent. Just what protection am I given when I am granted a patent? A patent is really nothing more than the right to fight. By means of a patent, I tell the world that they are to avoid using this idea for if they do I have the right to ask them to pay me royalties or to demand that they discontinue using my idea. Suppose that the Defrosta-Matic Company starts to use my patented idea of automatically defrosting an evaporator. I write them a letter telling them that they should discontinue their infringement. Their attorney says that patent number 17,287,386 was issued twenty years ago and covers the same idea that I have patented and which they are using. I and my attorney go over their story and find that because of this earlier patent they can use the idea the way they are applying it. In that case, I am out of luck.

Maybe I believe that they are actually infringing my patent in spite of their contention that patent 17,287,386 makes my patent practically worthless. My redress then is to the law courts who will decide if the Defrosta-Matic actually are infringing and will judge the amount of damages, if any, and the future rights to the usage.

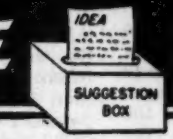
Patents are important but we must not put too much faith in them. Patents perform a desirable function in our highly integrated society by providing a reasonable protection to the inventor and at the same time making the fruits of man's inventiveness available to society. A patent is not the assurance of wealth to the inventor—it is only a hesitant step in the long hard road toward financial success.

★ ★ ★

Highways Are Cold Tested

DID you know that even the concrete and macadam roads you glide over so smoothly in your car have reached this stage of perfection because refrigeration provides a means of testing them? Sections of the road structures used are placed in refrigerated cabinets and subjected to grueling tests, similating winter conditions. It is just another example of the importance of refrigeration.

SERVICE POINTERS



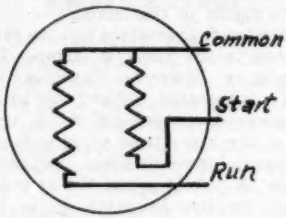
A department for the exchange of ideas on new devices and methods of improving service work. Five dollars is paid for each pointer published. Write up your idea today and mail it to the Service Pointer Editor.

Determining Common, Run and Starting Terminals

THE refrigeration service engineer is often confronted with the problem of determining the common, run and starting leads or terminals of a split phase or capacitor motor, hermetic or semi-hermetic unit (which use split phase or capacitor type motor) without the aid of a wiring diagram. The winding can be selected simply and speedily by taking three readings with an ohm meter and making a simple diagram.

Procedure:

1. Disconnect all wires leading to the three terminals or leads including capacitor.



2. Give each terminal a number or letter as a matter of reference (1, 2 and 3).

3. With the ohm meter take all the possible combinations of readings which would be:

1 and 2 .....ohms.
2 and 3 .....ohms.
1 and 3 .....ohms.

4. Starting and running have the highest resistance. Starting and common have the second highest resistance. Running and common have the lowest resistance.

For example: On a hermetic unit we have obtained the following readings: 1 and 2—10 ohms; 2 and 3—7 ohms; 1 and 3—5 ohms. Our highest reading is between 1 and 2, second highest 2 and 3, and lowest 1 and 3. Making a simple diagram and following the rules as outlined we have the results as shown in sketch.

On split phase and capacitor motors there are four leads coming out of the winding—two are starting and two are running. One start and one run are connected together to make the common. The reason for bringing out four leads is so that the direction of rotation can be changed. On all hermetic units (except early Gibsons) there are only three terminals, namely, start, run and common.—*Submitted by Oliver K. Rolf, Schenectady, N. Y.*

★ ★ ★

Getting Oil in a Crosley

DID you ever have a Crosley conventional unit where the compressor was dry and you couldn't put in oil because some previous mechanic had stripped or broken off the oil plug trying to get it out?

Pump down the compressor, remove the head and valve plate assembly, remove the wafer and its retainer from the top of the piston, turn flywheel until piston is at its lowest point and just pour in the oil. Then turn the flywheel and the piston will come up and the oil will be drawn into the crankcase. Three times and you will have the right charge of oil.—*Submitted by D. Seibert, Astoria, N. Y.*

★ ★ ★

Insulating Refrigerant Lines

THIS suggestion deals with the insulating of refrigerant tubing lines between the condensing unit and evaporator where the unit is any distance away from the evaporator. The liquid line on such installations is usually run

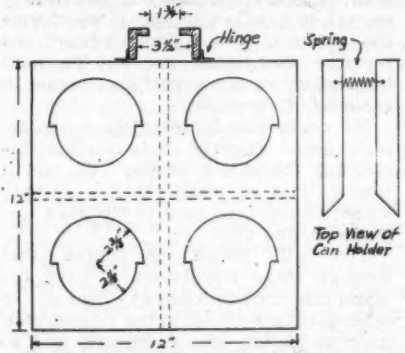
right along side the suction line and often clamped, soldered or taped to it. This makes insulation of the suction line more difficult since no manufactured pipe covering will fit over the two lines exactly.

However, I have found that a very neat and satisfactory job can be done by the use of cork pipe covering and commercial paraffin. Select a size covering which will fit over the two pipes freely but snugly and apply the covering in the conventional way, using waterproof cement and copper wire and breaking the joints. Then drill ½" holes about 3 feet apart on the top side of the covering and seal up all other cracks with asphalt emulsion. Then pour melted paraffin or wax until each hole is full to the top. After this cools you will have a sturdy and waterproof insulation. A final coat of black paint will seal all cavities.—*Submitted by John S. Rochat, Fountain City, Tenn.*

★ ★ ★

Service Drum Rack

HERE is a sketch of a refrigeration rack and oil can holder which I have been using for a long time and have found it to be very helpful. The oil can holder was only recently added.



This refrigeration rack prevents the small service drums (3 and 5 pound sizes) from rolling and banging around in the car; keeps them where they can be easily secured when needed; and protects the valves and fittings. The small radius for the bottom should be the approximate size of the drums being used to keep them from rattling—and the large radius at the top of the opening makes it easy to remove the cylinders from the rack.

The oil can holder fastened to the top of this refrigerant rack is merely two angle shaped pieces of wood sawed out of two pieces of 2 x 2's 8" long and hinged as shown. This keeps the oil can where it can be found; prevents the spout from getting messed up and also keeps the can from turning over and all of the oil leaking out.

This rack is very easy to make and costs but very little for material. Material needed: two 1" x 12" x 12" pieces for front and back; four 1" x 12" x 10" pieces for sides, top and bottom; two 1" x 4" x 10" pieces for bottoms for top compartments; and two 1" x 4" x 10" pieces for dividers for top and bottom compartments. I am using a 1938 Chevrolet 2-door for service work and this rack is set in the trunk compartment. I just would not be without it.—*Submitted by C. C. Pride, Tulsa, Okla.*

★ ★ ★

How to Avoid Bath When Cutting Valveless Water Line

HERE'S a thought that might prove helpful on some of those water cooler and soda pop hookups that we all run into without a water shut off valve.

Simply turn on all available faucets and flush the toilet then cut your line and presto—not much water at all. It's really simple this way.—*Submitted by E. F. Cassing, Boonville, Mo.*

"I KNOW WE ADVERTISE WE GO ANYWHERE, BUT AFTER ALL—."

QUESTIONS AND ANSWERS

Milk Cooling

QUESTION 832: I have a milk storage room to refrigerate 7 feet high x 11 feet x 15 feet, inside dimensions, insulated with four-inch corkboard. This room is to contain a brine tank five feet high, six feet long, and two feet wide, for cooling about 200 gallons of milk from a 100-gallon pasteurizer (two batches) once a day, the milk to be cooled over a new 6-foot enclosed type aerator with the top section precooled with well water at 52 degrees.

The bottler has a capacity of 100 gallons in 20 minutes, but my customer is willing to run the bottler slower if necessary. The brine tank already has a coil of 75-100 feet of ⅝-inch copper in it with thermostatic expansion valve. As an auxiliary cooling coil, he has a Frigidaire C-440 blower coil. This is operated with a Frigidaire "C" compressor, one-horsepower, 2½-inch bore, 3½-inch stroke, 360 rpm., 16¾-inch flywheel with a rating of 516 pounds, 14 hours, 80 degrees condensing medium, 7-inch back pressure, 20-degree coil, in their rating. The blower is controlled through an E.R.V. and compressor with a pressure switch. The water to cool the condenser will come from a deep well. SO_2 gas is used in the equipment now.

1. Will this compressor do the work required? 2. Will the brine tank and C-440 refrigerate the room? This job has been working with a smaller cooling room and smaller aerator with the same bottler and same amount of milk. 3. Could this job be changed over to F-12 or methyl gas to an advantage? If so, which gas would you recommend in this case? What size motor should be used? What compressor speed? Will any other changes other than expansion valves be required? 4. Would you recommend controlling the compressor with a thermostat bulb immersed in oil well in the brine? 5. Could a snap-action valve be used on the blower coil in this set-up to assure defrosting? The cooler temperature will be 40 degrees.

ANSWER: According to my calculations, the amount of heat to be removed from 200 gallons of milk will be 47,500 B.t.u. per day, or in other words, regardless of whether the 200 gallons is run over the aerator all at one time, or whether it is run over in two batches, the load on the machine will still be 47,500 B.t.u. per day. This we might term the "product load."

The load, due to heat leakage through the walls of the walk-in cooler, including the service load, will amount to about 78,000 B.t.u. per 24 hours. Therefore, our total load for the above two items will be 125,500 B.t.u. Since we will not want our machine to run more than 16 hours per day, it will have to have a capacity of 7,850 B.t.u. per hour.

The Frigidaire Model C compressor, is capable of delivering 5,307 B.t.u. per hour, which, of course, is not nearly enough to handle this job. If we change the system over to a Freon system and increase the motor size to the next larger size, we can expect an increase in capacity of about 30%.

We could also increase the compressor's speed slightly, thus further increasing the output of the unit, and it may be that we could reach a capacity which would take care of the load imposed on the unit.

You will notice, of course, that through these calculations I have not taken into consideration any load due to other products placed in the refrigerator, such as butter, cream, cheese, and so forth. You haven't given me any information on this, and I don't know whether there are other loads to be considered.

Run Milk Slower

All this, of course, has nothing to do with how fast the milk is run over the aerator, since we are considering only the average load per hour over a 24-

hour day. There is one more factor which might help, and that is, if the milk is run over slow enough that the well water will cool the milk down to a lower temperature than the 70 degrees used in these calculations.

I noticed in the calculations you used that you consider the temperature difference of 30 degrees, or in other words, a cooling range from 70 degrees to 40 degrees, which would have to be provided by the refrigerating system. If it is possible to reduce the milk temperature another five degrees by the use of water, the load on the refrigerating machine would be reduced considerably, and it is quite likely that this machine would have sufficient capacity.

I have no data on the C-440 coil, and cannot determine whether this is large enough to refrigerate the room; however, I don't believe that it would require a very large coil to do this work, since the brine tank is installed in the refrigerator, and it will supply considerable refrigeration to the cooler.

As for the control set up, I believe those used at the present time would be the best to continue with. There would be no advantage in having a thermostat bulb immersed in an oil well in the brine. The snap-action valve on the blower coil would be necessary to assure self-defrosting, if you find it necessary to reduce the brine temperature down below that of the blower coil, or in other words, if the coil in the brine tank is operated at a much lower temperature than the blower coil.

Beer Cooling

QUESTION 833: I am installing a refrigerated beer dispenser using six taps of beer, one seltzer, and one water tap. I am using 100 feet of ⅝-inch tubing submerged around the inside of a water tank thirty inches deep, twelve inches wide, and forty-eight inches long, insulated with two inches of cork. Each beer tap has fifty feet of block-tin coil; the water coil has twenty-five feet of block tin; and the seltzer tap has two ½-gallon containers attached in series. All the coils and containers are submerged in the water tank. I am using air bubbles to agitate the water in order to maintain a constant temperature throughout the water tank.

The bartender tells me that he draws an average of ten ounces of beer a minute; peak load would be double that amount for about three hours. The amount of water and seltzer drawn is about half that of beer. The beer enters the dispenser at about 55 to 60 degrees; the water and seltzer enter at 70 degrees; and the desired temperature of beer and water is 40 degrees.

How much beer does fifty feet of block tin hold? How would you compute the B.t.u. load for refrigeration? If I used 100 feet of ½-inch tubing for refrigeration, what would be the difference? Used on a multiple hook-up system above 32 degrees, what pressure-limiting device do you recommend? Using a single hook-up on Freon gas, what pressure settings do you recommend?

ANSWER: I will endeavor to answer your questions in the order in which you have stated them. First, how much beer does fifty feet of block tin coil hold? You haven't told me what the diameter of this tubing is; therefore, I am unable to tell you how much beer it would hold; since this tubing is sold in anywhere from quarter-inch to half-inch diameters, there would be considerable difference in the different sizes. This, however, you can calculate yourself by determining the cubic inch capacity of the tubing and multiplying by .15. One ounce of liquid will occupy about .15 cubic inches of space.

Computing Heat Load

In computing the B.t.u. load of these beer coils, it is necessary to consider the peak load, or the greatest amount of beer that will be drawn at any one time through the coils. Therefore, according to your statements, at its peak, there will be about twenty ounces drawn per minute, which equals ten gallons per hour. Seltzer and drinking water you state will be about half this amount, or five gallons per hour.

The specific heat of beer is .9; however, for this small amount and for easy calculation, we will consider the specific heat of the beer as being the same as water, and from our tables, we find that one gallon of water will contain 8.34 B.t.u.'s per degree rise in temperature.

According to your statements, the beer will have to be cooled 15 degrees, and

the water and seltzer 30 degrees. Our calculations then will be:

10 × 8.34 × 15 degrees = 1251 B.t.u. for the beer.

5 × 8.34 × 30 degrees = 2051 B.t.u. for the water and seltzer.

The total B.t.u. load will be the sum of these two, or 3302 B.t.u.

Five-eighths-inch tubing has a circumference of 1.9635 inches; therefore, 100 feet of this tubing will have a total square foot area of 1.9635 divided by 12, times 100 equals 16.36 square feet.

We will work on the idea that there will be a twelve-degree temperature difference between the refrigerant and the water surrounding the coil, and because the water is going to be agitated, we will be safe in selecting a K factor of 15 for this coil. One hundred feet of ⅝-inch tubing, therefore, will be capable of absorbing—

12×15×16.36 = 2844 B.t.u. per hour.

Apparently, 100 feet of ⅝-inch tubing is none too large. However, under the operating conditions, there will be a three hour peak load, and during the balance of the day, the load will be approximately half of what we have figured. Therefore, it can be assumed that during the balance of the day there will be a considerable ice accumulation around the coil, which will act as a holdover to be used up during the peak load period. I believe, therefore, that a hundred feet of coil will be ample to take care of this job. After the above calculations and description, you can readily understand that ½-inch tubing would not be satisfactory for this job and would not provide sufficient square feet of cooling surface. If you wish to calculate the actual difference, you may substitute the figures for ½-inch tubing where ⅝ is used in the above.

If this cooler is used in a multiple system where all of the coils in the system are operating above 32 degrees, the only pressure-limiting device necessary would be a constant-pressure valve in the suction line, adjusted so that the pressure would never be lower than about 26 pounds back-pressure, in order to prevent the water bath from freezing solid. In using the coil on an individual machine charged with Freon, the pressure settings on the pressure switch should be 17 pounds cut-out and 27 pounds cut-in. In other words, it is desirable to hold a temperature of about 28 degrees in the coil.

Revision of ASA B9-1939 Code For Mechanical Refrigeration

BY E. T. BENSON*

IT WILL be of interest to those in the refrigeration and air conditioning industry to have an up to date report on the status of the revision work that has been taking place with respect to the American Standard Safety Code for Mechanical Refrigeration, ASA B9-1939, which is sponsored by the American Society of Refrigerating Engineers and approved by the American Standards Association. This safety code is also known as the ASRE Circular No. 15.

Of particular interest will be the fact that the initial revision has been completed by the various subcommittees, and has been submitted to the B9 sectional committee for consideration and approval, or for further comment and further revision, as the case may be.

If you are like the majority of persons who have had no knowledge of the whys and wherefores of ASA code routine, but who recently have been close to the revision work, you would like a few words of explanation so as to further appreciate and understand the importance and meaning of the above announcement — explanation on such questions as where the B9 Safety Code comes from, who revises it, what good is it. For convenience, we'll refer to the American Standard Safety Code for Mechanical Refrigeration by its more commonly known term, the B9

*General Sales, Frigidaire Division of the General Motors Corp., Chairman of the Relations Committee of the ASA Sectional Committee on the Safety Code for Mechanical Refrigeration, B9.

Safety Code . . . . that's the way its referred to in the industry.

Of most importance, and contrary to the opinion of many, it is not formulated by the ASRE nor the ASA. It is **sponsored** by the American Society of Refrigerating Engineers (ASRE) and **approved** by the American Standards Association (ASA). ASA simply sets up standard procedures and requirements that must be followed and adhered to in formulating the code in order to receive ASA approval.

These ASA standard procedures and requirements are the reason for the outstanding success of the 857 standards, including 152 safety codes, that have been formulated to date with ASA approval, and, further, these are the reasons that the entire refrigeration and air conditioning industry and the public can be assured of the best safety code that can be formulated. These ASA procedures provide the most democratic method of code formulation that can be conceived.

Also important is to know that the B9 Safety Code is not a national law or regulation. It is a suggested and recommended safety code which only becomes effective when adopted by a state or municipality by ordinance or other legal action.

The B9 Safety Code is formulated by a sectional committee consisting of groups who have an inherent interest in the formulation, adoption, or application of the code. Any organized group which has an inherent interest in the safety code may be represented on the sectional committee. Requests for such representation are approved by the American Society of Refrigerating Engineers and the American Standards Association. This approval is provided for to maintain an equitable balance of representation of the committee. Each group is classified as one of seven categories which are:

A. Manufacturers (makers of equipment)
B. Employers (purchasers, owners of equipment)
C. Employees
D. Governmental bodies having regulatory power or influence over the field in question
E. Independent specialists, such as representatives of technical societies, consulting experts with no exclusive business affiliation, and educators
F. Insurance representatives
G. Contractors

One of the American Standards Association regulations governing the formulation of a safety code is that no one of the above groups may consist of more than one third of the entire sectional committee. This assures a balanced representation and assures against control of the committee by some one group. It further assures that full consideration will be given to all parties who have an inherent interest. The organizations represented on the sectional committee are listed below:

Participating Groups

American Society of Refrigerating Engineers
Air Conditioning and Refrigerating Machinery Association
American Gas Association
American Institute of Chemical Engineers
American Institute of Electrical Engineers
American Institute of Refrigeration
American Meat Institute
American Society of Heating and Ventilating Engineers
American Society of Mechanical Engineers
Association of Casualty and Surety Companies (Accident Prevention Department)
Bureau of Explosives
Compressed Gas Manufacturers Association
Electric Light and Power Group
Frozen Food Lockers Institute
Heating, Piping and Air Conditioning Contractors National Association
International Acetylene Association
International Association of Governmental Labor Officials
Manufacturers Standardization Society of the Valve and Fittings Industry
Manufacturing Chemists Association of the U. S.
The National Association of Ice Industries
National Association of Mutual Casualty Companies
National Association of Practical Refrigerating Engineers

National Association of Refrigerated Warehouses — A Division of the American Warehousemen's Association
National Association of Refrigeration Contractors
National Bureau of Standards
National Electrical Manufacturers Association
National Fire Protection Association
National Retail Dry Goods Association
National Safety Council
New York Board of Fire Underwriters
New York City Bureau of Fire Prevention
Refrigeration Equipment Manufacturers Association
Refrigeration Service Engineers Society
Underwriters' Laboratories, Incorporated
United States Department of Labor, Division of Labor Standards

Officers

The sectional committee elects its own officers. Those elected at a sectional committee meeting held October 22, 1947 are:

Dr. William R. Hainsworth, Chairman (American Society of Refrigerating Engineers, representative) Vice President, Servel, Inc.

Mr. H. D. Edwards, First Vice-Chairman (International Acetylene Association, representative) Works Engineer, The Linde Air Products Company

Mr. E. T. Benson, Second Vice-Chairman (Air Conditioning and Refrigerating Machinery Association, representative) General Sales, Frigidaire Division, General Motors Corp.

Mr. Henry Lamb, member of the American Standards Association staff, is acting as secretary of the committee.

Because the B9 Safety Code has not been revised since 1939, it is understandable that ASRE and ASA received many suggestions for revision in order to bring the code up to date with modern refrigeration safety practices. Because of the volume of these suggestions and the difficulty of working with such a large sectional committee, the chairman of the committee appointed several subcommittees to consider the various proposals and to submit their recommendations to the sectional committee for consideration and adoption.

The members of these subcommittees were chosen for their knowledge of the subject and with an effort to obtain cross-sectional representation such that the interest of all parties could be given consideration. Necessarily these subcommittees had to be small working committees in order to effectively and quickly cover the work involved.

The various Revising Subcommittees are as follows:

Code Drafting Subcommittee
Subcommittee on Safety Valves
Subcommittee on Specifications Related to the Unfired Pressure Vessels Code
Subcommittee on Refrigerant Piping Valves and Fittings
Relations Subcommittee

The first subcommittee meeting held was that of the Code Drafting Subcommittee which met in the afternoon of the day of its appointment, October 22, 1947. Since that time many meetings have been held, some being for two days duration. The subcommittees have cooperatively devoted a great deal of their time to the work assigned to them, and have worked through many difficult situations. There has always prevailed an outstanding atmosphere of cooperation and consideration of all interests in the subjects discussed. Uppermost in the minds of all has been the interest of safety to life and property and these have been considered in the light of practicability and necessity.

Draft Copies Distributed

Now after many hours of work, all suggested revisions have been considered and the results edited, drawn up in draft form, and submitted to the sectional committee for consideration. Draft copies of the proposed revision have been distributed to all sectional committee members for their review so they can be in a position to approve or comment at the next sectional committee meeting. This meeting will be called sometime this fall or early winter.

Everyone interested will find, no doubt, that he is represented by one of the organizations listed above. In the event it is desired to review and comment upon the proposed revision, a request for a draft copy should be directed to the association or group to which an individual may belong and which is represented on the sectional committee. Comments or suggestions should be directed to the sectional committee member so that he in turn, may compile and coordinate all of these suggestions. Thus the representative who attends the sectional committee meeting will be in a position to speak officially for the membership which he represents.

Only National Code

Of particular importance is the fact that the proposed American Standard Safety Code for Mechanical Refrigeration, ASA B9, is the only national refrigeration safety code suggested. Because of the method used in its formulation, it is unquestionably a fair and adequate safety code for the protection of life and property of the public. Therefore, everyone in the refrigeration industry should have an interest in the adoption and enforcement of this code by any state or municipality which desires to adopt a safety code.

Some special advantages may be expected to result from adoption of the code by municipalities without further restriction or revisions. Such adoption will help bring about uniform safety regulations for refrigeration and air conditioning systems throughout the country with adequate protection of the public. As a result, manufacturers will be able to design uniformly established safety provisions into the equipment, with consequent elimination of the added cost of factory processing of equipment to meet special code regulations in different municipalities. Refrigeration equipment installers and inspectors will also benefit by having a uniform safety code to follow.

The suggestion is made, therefore, that everyone concerned with the refrigeration industry take the necessary Code become the one active uniform steps to insure that the ASA B9 Safety code throughout the country.

The currently effective B9 Safety Code, the American Standard Safety Code for Mechanical Refrigeration, ASA B9-1939, is considered the best and most complete safety code now in existance. However, the many suggestions submitted concerning its revision have reflected advancements in the art of refrigeration and air conditioning. The majority of these suggestions have tended towards greater leniency and towards relaxing the safety code, particularly with regard to provisions governing Group I refrigerants.

It has been reported that there have been criticisms due to the fact that the B9 Safety Code had not been revised since 1939. The ASA standard procedure provides that each safety code should be reviewed and revised at least once every three years. This would have been done had it not been that the difficulty of getting people together during the war years made it impossible to have a sectional committee meeting. Urgent matters of postwar development also made it difficult for the sectional committee to meet immediately after the war. However, a meeting was held on October 22, 1947. All will agree that speedy action has been taken by the revising subcommittees who have been working since their appointment on that date.

It is entirely conceivable that further suggestions concerning the present B9 revision may result in the need of further committee meetings before it receives complete acceptance by the sectional committee. It is important, therefore, that everyone know that the present revision is only a draft and that no portion of it is effective until accepted by the sectional committee and approved by the American Standards Association.

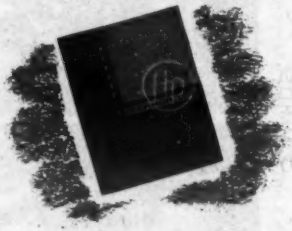
★ ★ ★

Refrigeration for Rubber Tires

A NEW synthetic rubber tire now being made in limited numbers, according to the makers, will give up to 30 percent more miles than the best natural rubber, because refrigerated mixing kettles produce what is known as "cold rubber." The synthetic product is cheaper than natural rubber and now, thanks to the new process, will be tougher. It's another field for refrigeration.

There's a type and size to fit every application, from the smallest fractional-tonnage job to the large air conditioning systems. Each is built to the highest of precision standards in operating efficiency,

There's a type and size to fit every application, from the smallest fractional-tonnage job to the large air conditioning systems. Each is built to the highest of precision standards in operating efficiency, to offer you accuracy in positive, "trouble-free" refrigerant control DEPENDABILITY that helps you to satisfied customers, increased business and steady profits.



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Standardize on A-P DEPENDABLE Valves. You'll know why they're the leaders in demand everywhere.

AUTOMATIC PRODUCTS COMPANY

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Export Department, 13 East 40th Street, New York 16, N. Y.

DEPENDABLE *Refrigeration Valves*

...ended and Installed by Leading Refrigeration Service Engineers

R801

Sky line view of Chicago Loop across Grant Park.

Chicago Awaits the RSES

11th Annual Convention — Hotel Sherman Friday, Saturday, Sunday and Monday, Nov. 19-22

CHICAGO will be the "mecca" for the refrigeration business on November 19 through November 22 when the 11th annual convention convenes at the Hotel Sherman, especially for the members of the Society. Since the last Chicago convention in 1942, Chicago and the entire state of Illinois have hoped to act as hosts to another R.S.E.S. convention. The holding of the 11th annual convention in this city will see the fulfillment of this expectation.

Educational Exhibits to Feature Meeting

In conjunction with the meeting, the third regional educational exhibit will be a feature. The entire exhibit hall and mezzanine floor of the Hotel Sherman will be used to house 100 exhibits of leading manufacturers. This exhibit should not be confused with the ordinary trade show type of display. Every exhibit is selected for display because of its educational value. It is not a sales display. Each exhibit of the leading 100 manufacturers who will display is built on the theme of . . .

. . . how it is manufactured
. . . how it should be installed
. . . why it does a good job
. . . how it should be serviced

This educational exhibit is the result of several years' conferences between R.S.E.S. and the Refrigeration Equipment Manufacturers Association committees. The value of these exhibits has been demonstrated in the two held previously in San Francisco and Boston.

Service engineers and contractors can expect to get individual attention and answers to their installation and service problems from company engineers and service personnel who will man the exhibits.

R.S.E.S. GENERAL CONFERENCE COMMITTEE

ED RICCIO WILLIS STAFFORD

F. H. Lilley, who heads the Conference committee appears among the International Directors of R.S.E.S.

New Features!

New Methods!

New Design!

HERE!..The New GE Line of Condensing Units

Greater sales appeal and easier installation and maintenance were two of the most important considerations in the designing of General Electric's new line of condensing units for the commercial refrigeration field.

Including units from ⅙h.p. to 1½ h.p., the new line features eight air cooled models and 4 water cooled models. This line actually meets the commercial market's requirements with a maximum capacity range integrated in three basic compressor sizes—*many vital parts of which are made to be interchangeable!*

In this new condensing unit line, G. E. has embodied many big condensing unit features that mean greater assurance of long life, dependability, lower-than-ordinary operating costs, and lower installation and service costs. Learn more about them by contacting your G-E representative today! *General Electric Company, Air Conditioning Department, Section C81210, Bloomfield, New Jersey.*

GENERAL ELECTRIC

Refrigeration Equipment

Time Schedule—R.S.E.S. Educational Program and Exhibits

THURSDAY, NOVEMBER 18

10:00 a.m.—Board of Directors' Meeting.
Evening —Registration for Early Arrivals.

FRIDAY, NOVEMBER 19

9:00 a.m.—Registration.
2:00 p.m.—Convention Opens—Business Meeting.
4:00 p.m.—Servicing Water Coolers,
Earl Jennings, Service Manager, Temprite Products Corp., Detroit, Mich.

SATURDAY, NOVEMBER 20

9:00 a.m.—"Question Box" Program.
10:00 a.m.—Servicing Milk Coolers,
William Ural, Victor Products Corp., Hagerstown, Md.
11:00 a.m.—Selecting and Installing Finned Evaporators,
C. L. Bensen, Manager, Refrigeration Div. McQuay, Inc., Minneapolis, Minn.
12:00 a.m.—Recess.
12:30 p.m.—Educational Exhibits open.
5:30 p.m.—Educational Exhibits close.
6:00 p.m.—Banquet and an Evening of Fun.

SUNDAY, NOVEMBER 21

10:30 a.m.
2:00 p.m. —Educational Exhibits Open.
1:30 p.m.—Safe Handling of Compressed Gases,
Robert Moore, Engineer, Superior Valve & Fittings Co., Pittsburgh, Pa.
2:30 p.m.—Built-In Motor Protection,
B. O. Haun, Engineer, Spencer Thermostat Co., Attleboro, Mass.
3:30 p.m.—Design of Motor—Speed Compressors.
C. E. Ploger, Chief Engineer, Electric Div., Servel, Inc., Evansville, Ind.
5:00 p.m. to 10:00 p.m.—Educational Exhibits open.

MONDAY, NOVEMBER 22

9:00 a.m.—"Question Box" Program.
10:00 a.m.—Concluding Business Session.
12:00 a.m.—Adjournment.
12:00 a.m. to 4:00 p.m.—Educational Exhibits open.

YOU'RE RIGHT!

KELVINATOR PARTS ARE PRICED RIGHT...
ALWAYS RIGHT FOR THE JOB!

Every job goes right—when you use quality-built parts . . . from Kelvinator!

You'll like Kelvinator's time-saving "one-stop" service . . . where you can choose from a *complete* line of refrigeration parts and supplies that are "tops" for *quality*—and *competitively priced!*

Stop in at your nearest Kelvinator Parts Depot soon. You're sure to find exactly what you want—and you'll like the fast, friendly Kelvinator service. Mail or phone orders handled promptly . . . Kelvinator Division, Nash-Kelvinator Corporation, Detroit, Michigan.

GET YOUR COPY New Handy Catalog of Refrigeration Supplies

Here's the *quick, easy* way to buy refrigeration parts and supplies. All information and prices are grouped for easy reference. Ask for it at your local Kelvinator Distributor or Zone Office.

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CONDENSING UNITS
REFRIGERATION PARTS AND
SUPPLIES

BUY KELVINATOR FOR ALL YOUR REFRIGERATION REQUIREMENTS

R.S.E.S. International Officers

W. J. MARSHALL, Toronto
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C. C. C. HARRIS, Cambridge
1st Vice President

A. L. ROBERTSON, Madison
2nd Vice President

R.S.E.S. Educational Program

As usual the educational program of the convention will feature eminent authorities on the subjects they have been selected to speak on. Paul Reed, educational director of the Society, has arranged the educational program to bring to the convention, subjects of foremost interest to the men engaged in the rebuilding, installation, servicing and maintenance of refrigeration equipment.

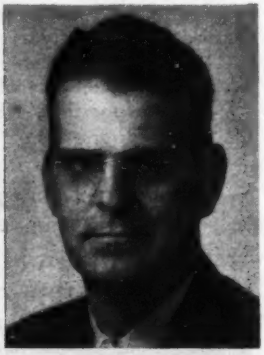
Of increasing importance in each annual meeting is the "Question and Answer" period preceding the educational sessions. Here you have an opportunity of getting the opinion and authentic answers to your "hard to solve" service problems. So we urge you to bring your "headaches" and return home with the correct answers.

Hotel Reservations

Hotel reservation forms have been mailed to all members of the Society. It is necessary that hotel reservations be made promptly to avoid disappointment. Through the housing committee of which John Heger, president of Chicago Chapter is chairman, it is hoped that required accommodations will be available for all. But the important thing is to get your reservations to the hotel without delay. Send all reservations directly to the Hotel Sherman, Chicago,

H. T. McDERMOTT, Chicago
Secretary

M. R. HANKS, San Diego
Treasurer



W. E. BOOTH, Richmond, Va.
Sergeant-at-Arms

"Thermo-Grip" used in sweat-fitting 1¼ "tubing to a strainer in installation of refrigeration system.

IDEAL "Thermo-Grip" soldering set

Just grip the copper fitting with "Thermo-Grip" Pliers and it's heated to soldering temperature quickly. There's no preparation, no preheating necessary. "Thermo-Grip" operates on the resistance heating principle — gives *instant heat* — closely controlled by the handy thumb switch.

NO FIRE HAZARD . . . "Thermo-Grip" may be used with perfect safety near ceilings or walls. Safe for the operator too—all parts fully insulated . . . current reduced to a harmless low voltage.

CONVENIENT—PORTABLE . . . The Ideal "Thermo-Grip" is light in weight, easy to use—one hand always free to handle the solder. Combination power unit and carrying case provides space for tools, leads, and parts; weighs only 25 lbs. The unit is adaptable to all types of soldering jobs with "Plier," "Pencil" and "Fork" Attachments. See your Wholesaler for full details. IDEAL INDUSTRIES, Inc. Sycamore, Illinois.

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Canadian Distributor: Irving Smith, Ltd., Montreal

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F. H. LILLEY
Chicago, Ill.

C. W. NEISEL
Corpus Christi, Tex.

C. R. VISGER
Kansas City, Mo.

Ill. Be sure, too, that you have your confirmation from the hotel. If your reservation has been mailed and no confirmation has been returned to you, write the Hotel Sherman without delay.

An Evening of Fun

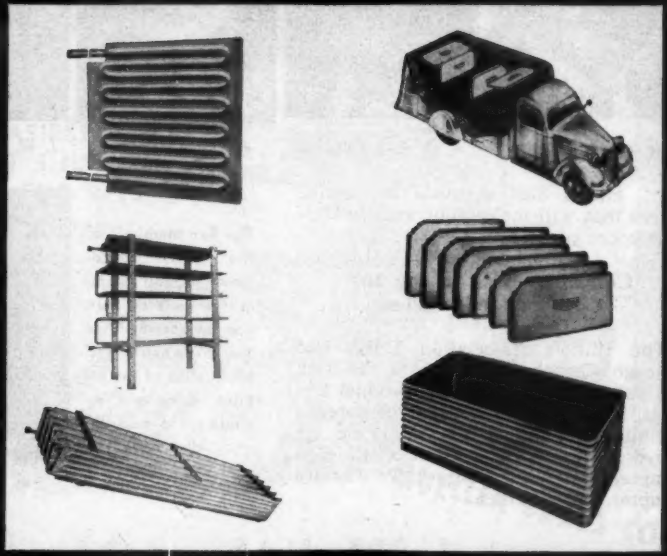
Saturday night will be an evening reserved entirely for fun. The R.S.E.S. annual banquet will provide the opportunity to get better acquainted. Come prepared to forget all your worries. The entertainment committee, under the direction of Dwight Orr, Chicago, has been in a "huddle" for many months planning an unusual evening of relaxation for members, guests and their ladies.

They won't divulge their plans in advance, but they guarantee that it will be a Saturday night you won't forget soon. Good food, good music and good fun will be a "hard-to-beat" combination.

Chicago—An Ideal Convention City

From the "Time Table" of events you will observe that free time has been provided in the evening to visit some of the famous Chicago attractions. The Hotel Sherman, located in the center of all activities, is convenient to the world famous Michigan Boulevard, State Street, the lake front, the Merchandise

KOLD-HOLD *Design*
opens the door to Refrigeration Profits



KOLD-HOLD "Quick Action" Serpentine Plates have a multitude of applications and combinations . . . all profitable to the user. Used separately, in banks, in plate stands, or as cabinet liners, they assure you the following advantages:

1. Easy installation.
2. Maximum prime surface.
3. No possibility of short circuiting the flow of refrigerant, which flows in one continuous pass from inlet to outlet.
4. Highest rate of plate heat acceptance.
5. Oil logging positively prevented.
6. Minimum pressure drop.
7. Tested under pressure.
8. An appreciably higher "K" factor.
9. Thoroughly cleaned and dehydrated.

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Jobbers in Principal Cities

KOLD-HOLD MANUFACTURING CO.,

PROCESSING · TRANSPORTATION · STORAGE

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REMA Educational Exhibit Committee

H. F. SPOEHRER

K. B. THORNDIKE

E. M. FLANNERY

J. M. SCHLEMMER

Mart, and a host of other interesting places that will make your visit to Chicago more pleasant.

Committees Working for Convention Success

The Illinois Association RSES and Chicago Chapter are hosts to the 11th Annual Convention and Educational Exhibit. Heading the general conference committee is International Director Floyd Lilley with E. Riccio, Chicago Chapter, and Willis Stafford, Tri-County Chapter, co-chairmen.

The five members of the REMA Educational Exhibit Committee pictured here are responsible for the planning and production of the exhibit which will include more than 100 displays.

G. E. GRAFF

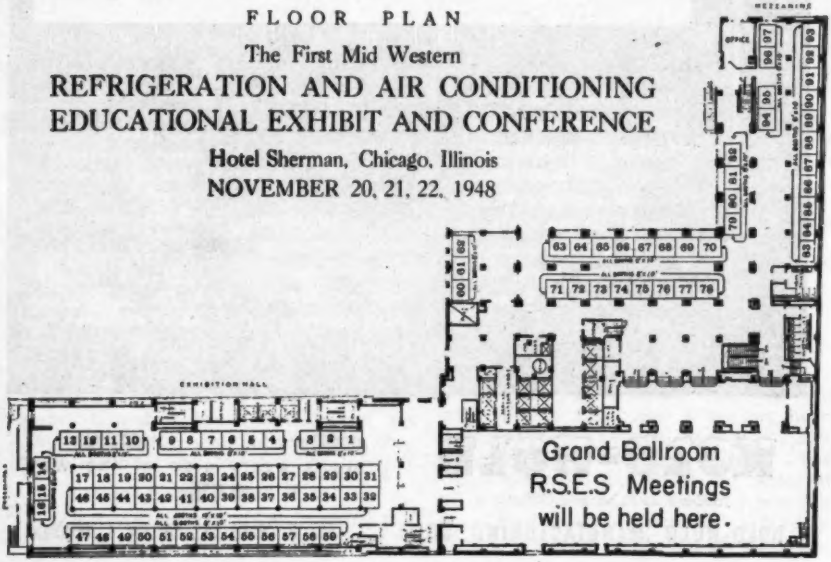
FLOOR PLAN

The First Mid Western

REFRIGERATION AND AIR CONDITIONING EDUCATIONAL EXHIBIT AND CONFERENCE

Hotel Sherman, Chicago, Illinois

NOVEMBER 20, 21, 22, 1948



ITS **NYLON** SEAT DISC · · · ·

Ends YOUR SEATING TROUBLES

THE EASIEST AND SUREST SHUT-OFF MADE FOR REFRIGERATION USE.

THE *New*

MUELLER BRASS CO.

Packless line valve...

Molded nylon is the seat material for which the valve industry has been searching for years.

Molded nylon seat disc will stand up to regular charging board usage.

- The easiest shut-off in the field.
- Phosphor bronze and stainless steel diaphragms.
- Ports-in-Line.
- Large Hand Wheel.
- No Springs.

MUELLER BRASS CO.
PORT HURON, MICHIGAN

Room Rates

Single Room	$ 4.50	$ 5.95	$ 6.95	$ 7.45	$ 8.45
Double Room	7.00	8.45	9.45	9.95	10.95
Twin	8.45	9.45	9.95	10.95	11.95
Alcoves	11.95	12.95	13.95		
Parlor and 1 Bedroom	11.95	14.95	16.95	20.95	
Two rooms connecting bath between—for 2 persons				9.00	9.90
Two rooms connecting bath between—for 3 persons				11.50	12.40
Two rooms connecting bath between—for 4 persons				14.00	14.90
Room for 3 persons		10.95	11.45	12.45	13.45
Room for 4 persons		12.45	12.95	13.95	14.95

Chairmen of the other committees are: Housing—John Heger, President Chicago Chapter; Entertainment—Dwight Orr, Chicago Chapter; Reception—Dan Gott, Chicago Chapter; Publicity—R. L. Hendrickson, Tri-County Chapter; Registration—Gordon Eubanks, Corn Belt Chapter; Secretary of the Committee—B. V. Clark, Tri-County Chapter; Coordinator of Auxiliary Activities—Wm. J. McCarley, President of the Illinois State Association; and Assistant to International Sergeant-at-Arms—Eugene Monti, Chicago Chapter.

RSES Auxiliary Plans For Chicago Meeting

PLANS for the entertainment of the ladies attending the convention are moving along rapidly. Chicago itself offers many attractions for the visiting ladies.

MRS. J. L. DRISKELL
President

MRS. CECIL VISGER
Secretary

Its well known shopping center on State Street, the theatrical district, radio broadcasts, Museum, Aquarium, Planetarium, Art Institute and many other attractions are but a few of the many interesting sights that are always of interest to the visitor.

Mrs. J. L. Driskell, Burley, Idaho, president of the Auxiliary, and Mrs. Cecil Visger, Kansas City, Mo., secretary, assure every visiting lady, whether or not she is a member of the Auxiliary, a cordial invitation to participate in all the activities planned.

Illinois Ladies Hosts

Mrs. Floyd Lilley, Chicago, is convention chairlady of the local convention committee and every effort is being made by the committee to make the visitors stay in Chicago a pleasant and memorable one.

The wives of the members of the Chicago Chapter and of the Illinois State Association will join with Mrs. Lilley in arranging the ladies program and in acting as hostess to the visitors.

Come prepared for a good time!

Copeland engineering

Copeland production

Copeland quality control

These add up to easier sales . . . for you !

Especially since Copeland follows through with consistent advertising and merchandising helps. Copeland makes every prospect a potential sale by maintaining the most complete and flexible line in the industry.

Copeland

DEPENDABLE *Electric* REFRIGERATION

Manufacturers of: Refrigeration Units, (Open-type and Copelametic), Water Coolers, Refrigerators.

COPELAND REFRIGERATION CORPORATION SIDNEY, OHIO

NARC To Hold Annual Convention At Sherman in Chicago, Nov. 18, 19

E. S. WRIGHT
President

H. E. WHEELER
1st Vice-President

J. H. LESSARD
2nd Vice-President

RALPH LAMPIE
Sergeant-at-Arms

N. EDELSTEIN
Recording Secretary

A. M. PALEN
Treasurer

A NEW kind of convention is planned for members and guests of the National Association of Refrigeration Contractors at the Sherman Hotel, Chicago, November 18 and 19. Feeling that there has been too much of the type of canned talk, consisting mostly of—"It is a great pleasure, etc."—the program committee has arranged for Panel-Forum type discussions of several important controversial issues.

Audience Participation

After some competent speakers set the problem forth briefly, they will engage in a battle royal among themselves followed by a session of questions from the floor, all on the general order of certain radio programs.

Subjects under panel discussion are—Guarantees — Licensing — Service Control Methods—Service Sales Methods—Equipment Merchandising Methods. There will also be brief addresses on—"How Recent Labor Legislation Can Effect You", "Finding, Hiring and Training Salesmen", and "Present and Future Business Outlook."

Meetings will be held at the Sherman Hotel, November 18 and 19. Members of R.S.E.S. who are meeting at the same place one day later are expected to come early and take in both meetings.

Members of N.A.R.C. will also have the opportunity of seeing the educational exhibits held in conjunction with the R.S.E.S. convention which will open on Saturday, November 20, and occupy the exhibit hall and mezzanine floor of the Hotel Sherman.

★ ★ ★

Steel Production High

A PHENOMENAL chapter in the American production saga is being written this year in the steel industry.

Despite constant shortages of scrap, good coking coal and railroad cars, the industry is producing at a record peacetime rate. Indications are that this year's output will reach 88,000,000 tons, exceeding the 1947 production by about 4,000,000 tons.

In 1949 steel men hope to turn out somewhere in the neighborhood of 94,000,000 tons, thanks to the huge expansion and modernization program still under way.

For
Maximum
Efficiency
Specify
STANGARD
Prime Surface Cold Plates
STANGARD plates are made for various applications, in any size, shape or form, including stainless steel—
PROMPT attention is given to new orders, with delivery schedules assured—
FOR DETAILS WRITE
STANGARD
REFRIGERATION CORPORATION OF AMERICA
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NEWS AND ACTIVITIES

COMING CONVENTIONS

11th Annual RSES Convention and R.E.M.A. Exhibition

Place: Sherman Hotel
City: Chicago, Illinois
Date: November 19-22, 1948
Secretary: H. T. McDermott, 433 North Waller Ave., Chicago, Ill.

National Association of Refrigeration Contractors

Annual Meeting

Place: Sherman Hotel.
City: Chicago, Illinois.
Date: November 18 and 19, 1948.
Executive Vice-President: E. J. Helminak, 353 Hippodrome Annex Bldg., Cleveland, Ohio.

Interprovincial Association

Place: Mt. Royal Hotel
City: Montreal, Que., Canada
Date: March 28 and 29, 1949
Secretary: R. G. Henderson, 38 Bedford Park Place, Toronto, Ont.

San Gabriel Dinner-Dance

SAN GABRIEL VALLEY'S first anniversary dinner-dance was held on August 21 at the Pasadena Athletic Club. In addition to enjoying a turkey dinner, the guests danced and played games. Mrs. Thomas H. Exton, who for many years lived in the Hawaiian Islands, entertained with authentic hula dancing. She made her own costumes out of countless pieces of cellophane, and they were beautiful. Paul Neuenschwander was the general chairman, capably aided by several of the members and their wives.

There were six door prizes consisting of hand made leather wallets (made by member Emil Luckert), lamps and sporting goods. The raffle was won by Clarence Marksberry. The prize was a Mixmaster. The evening ended as gayly as it began, to the music of Tommy Pedrini's orchestra.

★ ★ ★

New Chapter in Indiana

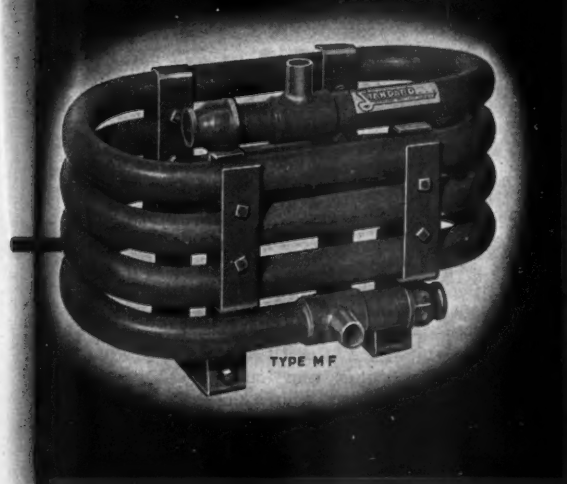
ON JULY 29th a formation meeting was held in Terre Haute, Indiana, to further plans for the organization of a chapter which, it was voted upon, is to be called the Wabash Valley Chapter. Officers were elected as follows: Robert A. Turner, *President;* Dennis W. Cummins, *Vice-President;* Edward Ellington, *Secretary-Treasurer;* J. H. Thomson, Jr., *Recording Secretary;* Herbert H. Williams, *Sergeant-at-Arms;* Carl Brady, *Eductional Committee;* and Carl J. Moeller, *Publicity Committee.* After calling the meeting to order, President Turner introduced Mr. Henderson who outlined the history of the Society and explained its aims and functions. Nineteen members were present. It was unanimously agreed that the chapter petition the National Society for a charter.

★ ★ ★

Charter Presented To Whaling City Chapter

A BANQUET was held at Cornell Hall in New Bedford, Mass., on September 16, for members of the newly organized Whaling City Chapter and their guests. Also present were International Director Wm. Tierney; International 1st Vice President Charles C. E. Harris; Arthur Andreen, President of the New England States Assn.; John J. Madden, Secretary of Boston Chapter; Frank Vieira, President of Providence Chapter; and William Remington, Secretary of Providence Chapter.

After dinner the meeting was turned over to William Tierney who reviewed the aims and objectives of the Society after which he officially administered



High Capacity

STANDARD

Multi-Flow CONDENSER

ECONOMICAL—The multiple tube design gives rapid heat transfer resulting in low water consumption and high condensing unit capacity. Refrigerant and water travel is at a minimum, thereby reducing pressure drop.

SIMPLE—Water flows through a cluster of ½" copper tubes in the Multi-flow condenser. Mounting is designed for easy installation.

CLEANABLE—Continous sweeping return bends permit easy cleaning. Simply disconnect the water inlet of the Multi-flow condenser. Then use a plumber's auger turned by hand or elecrtic drill.

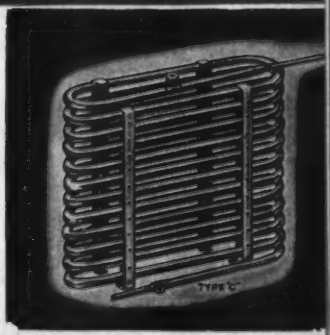
NOW AVAILABLE IN SIZES RANGING FROM 1½ to 15 H. P.

TYPE C SERIES

Standard's well-known, all-copper counterflow condenser meets the requirements for high capacity on ½ to 3 H.P. units. Compact, light, and fabricated on short radius bends for convenience in mounting and replacement.

Write for bulletin C-2.

Sold through leading wholesalers.



STANDARD *Refrigeration Co.*

332 S. HOYNE AVE. CHICAGO 12 ILL

the oath to the new members of the organization. He then presented the charter to President Frank Folger. Secretary Herve Couture read the names of members in good standing and Mr. Tierney awarded them their certificates and traveling cards for the 1948-49 season. Charles C. E. Harris and Arthur Andreen each in turn welcomed the chapter into the Society and in the New England States Association. John J. Madden likewise extended his congratulations.

Mr. Tierney then introduced some of the other visiting chapter members including H. Richardson of Rhode Island Refrigeration, Mr. Hough of Providence Chapter, and John Newton of Rhode Island Covering Co. Alfred Braley, Chairman, conducted the entertainment program. First there were a few selections on the concertina by one of the entertainers, then a magician captivated the audience with some of his sleight-of-hand tricks and amused them with his anecdotes. Stanley Howard, a chapter member, played a few well-chosen selections on the accordion. There were 75 members and guests present at this very successful banquet and meeting. Door prizes, donated by the chapter, were won by Arthur J. Doucet and Mrs. Alfred V. McGuire, Jr.

★ ★ ★

Illinois State Meeting Enjoys Good Turnout

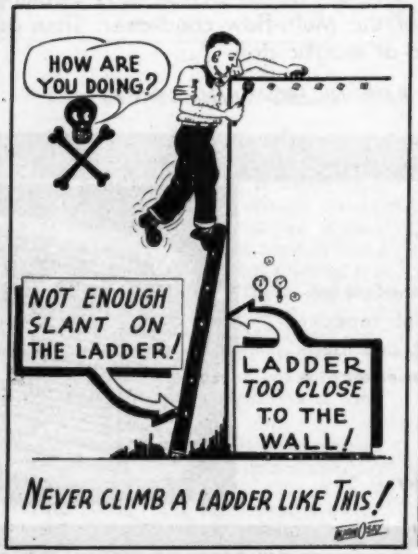
THE Illinois Association 11th annual meeting held in Springfield, Illinois, September 25 and 26, drew more than 200 visitors from the state of Illinois and neighboring states. It was a two-day meeting packed with worthwhile educational talks and supported by 23 manufacturers, wholesalers, manufacturers' representatives and others who displayed equipment and literature during the meeting.

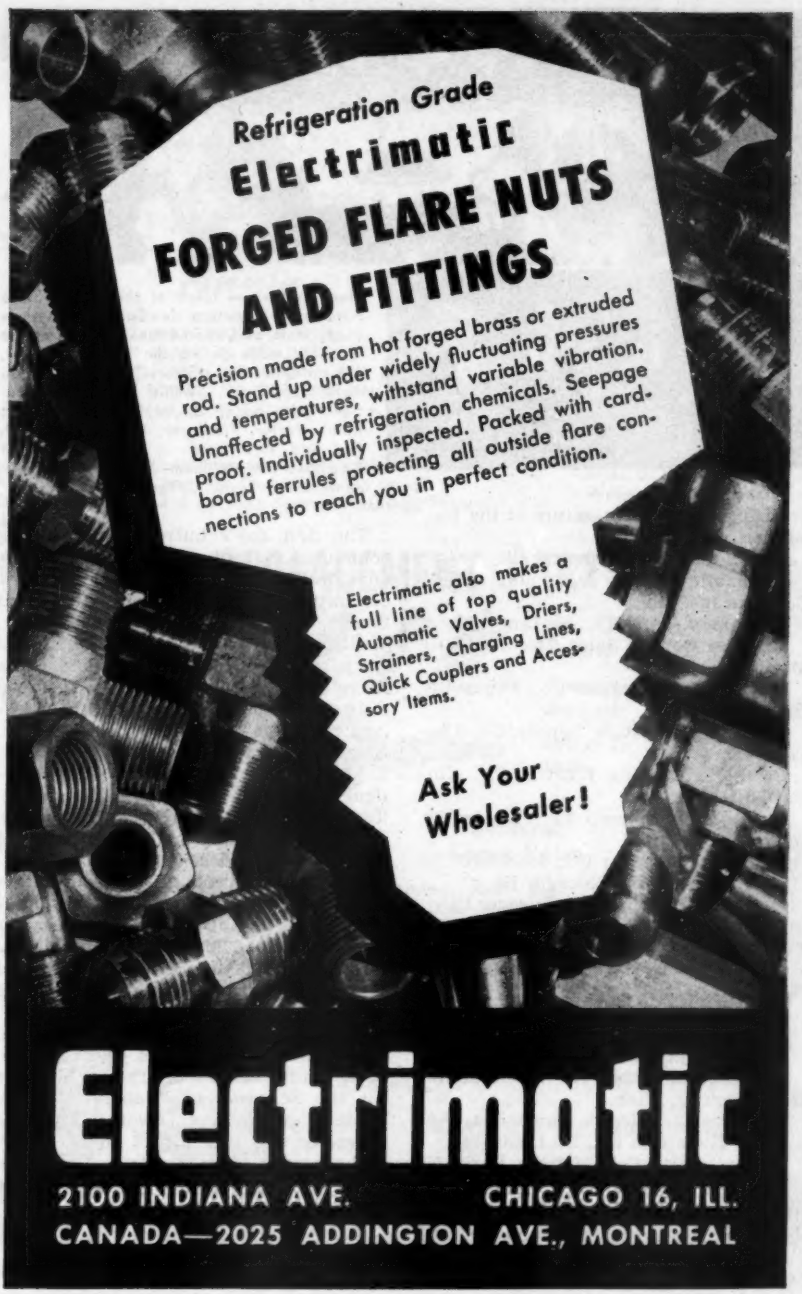
The session started off with an informal get-together Friday evening, September 24, during which refrigeration problems were discussed by the group. More than 100 of the visitors had arrived and registered by the close of this session Friday evening.

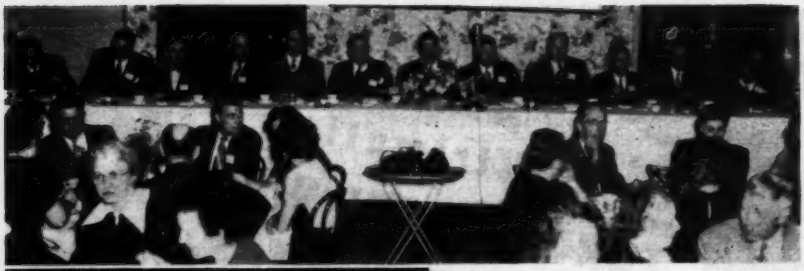
Companies exhibiting their equipment

Safety Has No Substitute

GREEN CROSS FOR SAFETY




Refrigeration Grade
Electrimatic
FORGED FLARE NUTS AND FITTINGS
Precision made from hot forged brass or extruded rod. Stand up under widely fluctuating pressures and temperatures, withstand variable vibration. Unaffected by refrigeration chemicals. Seepage proof. Individually inspected. Packed with cardboard ferrules protecting all outside flare connections to reach you in perfect condition.
Electrimatic also makes a full line of top quality Automatic Valves, Driers, Strainers, Charging Lines, Quick Couplers and Accessory Items.
Ask Your Wholesaler!
Electrimatic
2100 INDIANA AVE. CHICAGO 16, ILL.
CANADA—2025 ADDINGTON AVE., MONTREAL



These two views taken at the Illinois State Association meeting in Springfield, show (top) state and international officers at the speakers' table during the annual banquet. The newly elected officers (left) are, left to right, front row: Willis Stafford, Educational Chairman; B. V. Clark, Secretary; Ralph Porter, Treasurer. Back row: C. J. Fox, 2nd Vice-President; L. L. Sturch, 1st Vice President; William J. McCarley, President; Loren Taylor, Sergeant-at-Arms.

or displaying their literature at the convention were:

Airo Supply Co., Chicago, Ill.
Automatic Heating & Cooling Supply Co., Chicago, Ill.
Authorized Parts Co., St. Louis, Mo.
Brass & Copper Sales Co., St. Louis, Mo.
Budlock Refrigeration Co., Evansville, Ind.
Chase Refrigeration Supply Co., Chicago, Ill.
Complete Reading Electric Co., Chicago, Ill.
F. H. Langsenkamp Co., Evansville, Ind.
Gustave A. Larson Co., Rockford, Ill.
Harry Alter Co., Chicago, Ill.
Herman Goldberg Co., Chicago, Ill.
George W. Wilson, Manufacturers' Representative, Chicago, Ill.
Illinois Electric Works, Inc., East St. Louis, Ill.
Marquette Equipment Co., Peoria, Ill.
Payton Company, Chicago, Ill.
Polar Supply Co., Peoria, Ill.
Refrigeration and Air Conditioning News, Detroit, Mich.
Republic Electric Co., Davenport, Iowa
R. E. Thompson Co., St. Louis, Mo.
Service Parts Co., Melrose Park, Ill.
Tingle Refrigerator Co., Kansas City, Mo.
United States Electric Co., Springfield, Ill.
Wabash Mfg. Co., Chicago, Ill.

The first day's business session was conducted Saturday morning and included officers' reports, appointments of committees, reading of minutes, and finally the annual election of officers. William J. McCarley, President during the past year, and B. V. Clark, last year's Secretary, were again elected to serve during the 1948-1949 term. Other officers elected to serve with them are L. L. Sturch, Rockford, *1st Vice-President;* C. J. Fox, Springfield, *2nd Vice-President;* Ralph Porter, Bloomington, *Treasurer;* Loren Taylor, Carbondale, *Sergeant-at-Arms;* and Willis Stafford Warrenville, *Educational Director.*

Saturday afternoon, President McCarley called on the first educational speaker, George Lamb, Service Engineer for Schnacke, Inc. Mr. Lamb provided a pictorial tour of the Schnacke plant and told of the operation and construction of their compressors.

The second speaker of the afternoon was F. Ed. Ince of Marlo Coil Co., who spoke on the subject of "Proper Methods for the Selection of Evaporative Condensers and Cooling Towers." Mr. Ince described the function of these towers and provided some very useful selection data, illustrating his talk with blow ups from their catalog material.

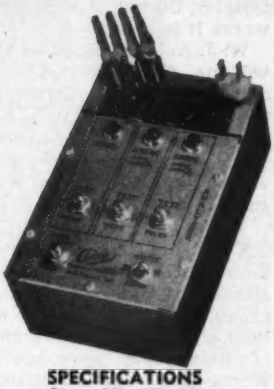
Next on the program was Wm. V. Richards, Sales Manager for H. A. Phillips & Co., who gave an illustrated talk

MORE PROFIT—LESS TIME

Analyze Hermetics without Guesswork

Let Annie Do It!

A HERMETIC UNIT ANALYZER which, in a matter of seconds, will positively indicate the nature of any electrical defect.



Annie

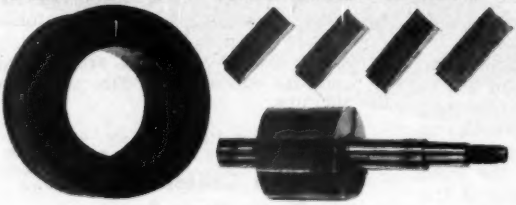
USED BY U.S. ARMED FORCES & U.S. DEPT. OF INTERIOR

REVERSES DIRECTION OF RUN
PROVIDES MANUAL STARTING
INDICATES OPEN OR GROUNDED FIELDS
RELEASES STUCK OR FROZEN UNITS—
stuck units can frequently be freed by reversing the running direction.

ACCURATE—you can estimate closely without fear of having to take a loss. A "must" in any repair kit. Don't be embarrassed by your customer asking: "how do you know?"

SPECIFICATIONS
Size: 3" x 5" x 8"
Weight: 1¾ pounds
Price: $16.50

COLDSPOT REPLACEMENT PARTS



For All Compressors Having 15/32 Shafts

Matched Set, Each. $14.50

Lots of 3, Each..... $13.80

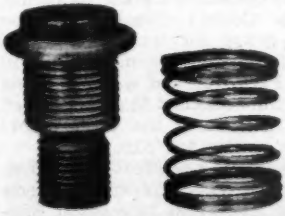
QUIET COLDSPOT CARBON VANES

Available in 3 Sizes—1"-1¼"-1½"
Each Set $1.25
Lots of 10 Sets..... $1.19
Lots of 25 Sets..... $1.13

Coldspot Check Valve

Stainless Steel Seat; Swedish Steel Disc; No Tools Necessary to Install in 5 Minutes

Each $2.25
Lots of 10..... $2.00



BELLOWS SEAL

Each $3.00
Lots of 10..... $2.85

Coldspot Drive Couplings & Dome Gaskets

MECHANICAL ENTERPRISES DEPARTMENT 36

4856 LANKERSHIM BLVD. NORTH HOLLYWOOD, CALIF.

on the application of their liquid injectors. Mr. Richards explained the construction and operation of the liquid injector, then showed many applications where it is used.

W. J. Aulsebrook, Sales Manager, Servel, Inc., the last speaker of the Saturday session, spoke on "New Opportunities and New Problems in Sealed Units." To illustrate his talk he used two operating models of Servel hermetic units which aided in showing how oil is circulated in the compressor and some advantages of construction.

Throughout the two-day session more than 21 door prizes were given out to the attendance. In addition, a number of prizes were given to the ladies during their entertainment program. Nearly all of these prizes were provided by the Wholesalers and manufacturers cooperating with the State Association.

Saturday night at the annual banquet the newly elected officers were installed by H. T. McDermott, International Secretary. An entertainment program and dancing filled out the entire evening.

Sunday

During the Sunday morning session the educational program was limited to one speaker, Oren Greenwood of General Engineering and Mfg. Co., who spoke on the subject "New Development in Air Conditioning Equipment and the Heat Pump." This seemed to be one of the most interesting subjects of the session, judging from the number of questions asked after Mr. Greenwood's talk. Mr. Greenwood pointed out that while the application of refrigeration to heating was a very interesting one, there were many problems to be solved before it could be considered generally practical.

A short business session occupied the balance of the morning during which time consideration of the next convention city drew four invitations from Illinois cities.

The ladies committee, including Mrs. Floyd Nichols, Mrs. Ralph Dobbins, Mrs. F. C. Meador and Mrs. Archie Fait, arranged for the entertainment of the ladies. This entertainment included a trip to Lincoln's New Salem State Park on Saturday starting at 11:00 a.m. A drawing for ladies' door prizes was made during this entertainment.

RSES Educational Department Establishes Office

FURTHER progress in the expanded educational program of the Refrigeration Service Engineers Society was recorded with the opening of permanent headquarters of the educational department, on September 1, at 2577 N. Teutonia Ave., Milwaukee 6, Wis., with Paul Reed as full time Educational Director.

All educational activities of the Society, including preparation of educational material, distribution of recorded talks, certificate examinations, etc., will be handled by the educational office.

Correspondence relating to these subjects should be addressed to the Educational Director, Refrigeration Service Engineers Society, 2577 N. Teutonia Ave., Milwaukee 6, Wis.

Members of the Society are invited to visit the educational office when in the vicinity.

★ ★ ★

Southern California R.S.E.S. Picnic Huge Success

By J. Pat Riley

GIVE me an old fashioned picnic for a swell time! One of the best and biggest R.S.E.S. social functions was the third annual Southern California picnic. The Orange County Chapter was the sponsoring group for the event which was held Sunday, September 19th, in the Irvine Park. It was a fast moving affair from the breakfast that was served at eight o'clock until the last visitors left for home after ten p.m.

At the 'roundup' breakfast, which was supervised by eats chairman Merle Soden, Jack Allen and Emmerson Burgess, thirty five pounds of hot cake flour, thirty pounds of bacon, one case of eggs and thirty five gallons of coffee was served to the 150 early arrivers. For the noon meal, the committee furnished

A dollar's worth of water-cooling ...for a nickel!

That's right — Marlo Cooling Towers save 95 cents out of every dollar of normal water cost — solve supply and sewage problems — by using the same water over and over.

For example:

In Straub's ultra-modern Clayton Plaza Market, St. Louis, one Marlo CT15 indoor cooling tower cools the water necessary for refrigerating the ice cream freezing, hardening and storage rooms, vegetable, meat and frozen food storage rooms, using Marlo products exclusively. Despite this heavy load, the rugged construction of the Marlo Cooling Tower assures many years of dependable low-cost service.

For lasting economy specify...

MARLO COOLING TOWERS and EVAPORATIVE CONDENSERS

MARLO • HEAT TRANSFER

MARLO COIL CO. / ST. LOUIS 10, MO.

thirty five gallons of orange juice and four hundred ice cream cups to supplement the basket lunches brought by the "guests."

The total attendance was 365 members and friends. The chapters participating with the number of people from each were: Arrowhead, 5; San Diego, 8; Old Baldy, 11; San Fernando, 12; Compton, 22; San Gabriel, 27; Orange County, 62; Los Angeles, 79; and Long Beach, 140. The beautiful attendance trophy was won for the second time by Orange County as the scoring for this gold figurine is figured on a chapter paid-up membership divided into the number attending the picnic from that group.

The Long Beach Chapter took home, for the second time, the baseball and the horse shoe trophies. The beach city's baseball team was led by Captain Jack Jordan and his players were as follows: catchers, Bob Schooler and Bill Boyd; pitchers, Stu Bell and Pres Clark; first base, Howard Hanks; second, Pat Riley; shortstop, 'Corry' Corrivelle; third, Joe Mura; and fielders, Jim Schooler, Bob Nichols and Dick Bagwill. Long Beach defeated Los Angeles 14 to one and then decisioned the Orange County team in a hotly contested game, four to two.

The Long Beach horse shoe team was Joe Mura and Pat Riley. This pair defeated Wilson and Johnson of San Gabriel, Wills and Rodgers of Los Angeles, Robinson and Sipherd of Orange County. Brown and Patten of Compton, and Hanks and Wampler of San Diego had been previously eliminated. San Gabriel Chapter won the tug of war in one of the toughest contests of the day.

Always one of the most interesting and active contests is the rolling pin throwing by the ladies. Mrs. Pres Clark proved that practice pays off as she carried off the first prize. Other ladies contests and the winners were: gum molding, Mrs. Oliva; clothes pin bombing, Dorothy Page; and water carrying, Dorothy Smith.

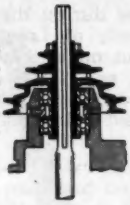
The entertainment committee, headed by chairman Howard Sipherd, presented

In these four photos taken during the Southern California picnic are shown: (1) The boys sack race in progress. (2) The tables are turned and Sheriff "Pop" Riley gets jailed. (3) The winning baseball team. Back row, left to right—Jim Schooler, Bill Boyd, Dick Bagwill, Bob Nichols and Bob Schooler. Front row are: Pres Clark, Corry Corrivelle, Stu Bell, Captain Jack Jordan (with trophy) and Joe Mura. (4) The long Beach Sheriff Squad doing a little advertising. They are, left to right, Stu Bell, "Pop" Riley, Larry Ostrander, Ed Murphy and Arlo Evans. Paul Butler of Orange County is behind the bars.

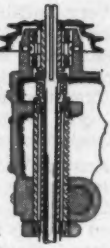
Photos by Everett Brown

BUILT-IN LIGHT
Provides shielded, shadowless illumination on work area. Independent on-off switch is built-in.

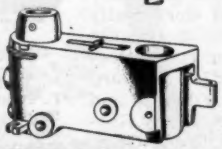
FREE-FLOATING SPINDLE
Design prevents misalignment, side thrust and whip. Precision splines in spindle and sleeve.



FOUR PRECISION BALL BEARINGS
Two on spindle, two on drive sleeve. Pre-lubricated and sealed precision type, no oiling required.

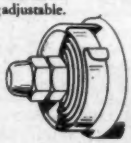


ONE-PIECE HEAD CASTING
Insures perfect alignment. Double-plug binder locks the head to column. Column bearing is NOT split.



BELT TENSION RELEASE
Flip of lever removes tension from belt for easy speed changes. Proper belt tension maintained.

ADJUSTABLE QUILL RETURN SPRING
Retracts quill instantly upon release of feed lever. Tension of spring adjustable.



QUILL BEARING ADJUSTMENT
Shoe-type take-up provides feather-touch tension and secure locking. Quill bearing is NOT split.

DEPTH GAUGE
Controls feed depth, length of return stroke, or locks spindle in any position. 16th graduations.

TABLE LOCK
Double-plug binder securely locks table to column. Eliminates misalignment. Column bearing is NOT split.

INTERCHANGEABLE SPINDLES
Spindles available to take No. 2 Morse taper shank tools, and for 1/2" straight shank tools, router bits, shaper cutters, etc.

CAPACITIES — SPECIFICATIONS

CAPACITY
Maximum drill size in iron or steel—½". Drills to center of 14¼" circle.

CHUCK
Capacity—0 to ½"

SPINDLE
Regular drill chuck type supplied.
Travel . . . . . 4"

CHUCK TO BASE DISTANCE
Bench Model—17"
Floor Model—46½"

SPINDLE SPEEDS
Four—655 to 4530 r.p.m.

TABLE SIZE
10" x 10". Tilts to any angle.

Bench Model $129.30

Floor Model $144.30

Prices, f.o.b. factory, include drill chuck and 1/3 h.p., 115 or 230 v., 1 ph., 60 cycle motor and switch.

SOUTH BEND LATHE WORKS

BUILDING BETTER TOOLS SINCE 1906 • 529 E. MADISON ST., SOUTH BEND 22, IND.

a very baffling magic show during the lunch hour. Bob Bradford, of Long Beach, and his dummy put on a very well received ventriloquist act. National Treasurer M. R. Hanks was introduced as were the present and past California Association officers.

Austin Fordyce was the general chairman for this gala affair and his many hours of planning and hard work really bore fruit as the huge crowd thoroughly enjoyed themselves. Other committees were: Austin Hicks, raffle; Howard Sharp, Publicity, assisted by Louise and Jim Rodgers of Los Angeles; Harry Hoskins, Shorty Allen and Otto LaGrou, games; and Paul Butler, registration.

One of the novelty stunts that provided a lot of fun and laughs was the Long Beach "hoosegow"; this was a steel barred jail mounted on a trailer. "Pop" Riley headed the sheriff's squad which consisted of Ed Murphy, Everett Brown, and Mr. Scott of Orange County. Roy Willis acted as judge while Lyle Evans was the "riot squad."

★ ★ ★

The above picture was taken at the August 26 dinner meeting of the Hub Chapter in Compton, Calif., when new officers of the chapter were installed by J. Pat Riley, Past President of the California Assn. After the installation a round table discussion on chapter activities was held, with many good suggestions coming from the visitors present for the affair.

Montgomery Bar-B-Que

THE Montgomery Chapter held its third annual Bar-B-Que recently with an attendance of about 125 members, their families and guests. Several members from Birmingham Chapter were present. The menu consisted of veal round, pork shoulders, southern style camp stew, potato salad, sliced tomatoes, dill pickles and ice tea. Sixteen gallons of the camp stew was made up in an old fashioned wash pot, and 140 pounds of the pork shoulders were cooked over the open barbecue pit—with 5 gallons of sauce to go with it. Everyone had a very good time and needless to say no one went hungry.

CHAPTER NOTES

• **ALLEGANY VALLEY CHAPTER, Olean, N. Y., Sept. 14**—Two new members, Raymond E. Plumley of Olean and David A. Baker of Smethport were accepted into the chapter. A letter was read from Mrs. Ora Mendell, First Vice-President of the National Auxiliary inviting the wives of the members to form an auxiliary and offering her help and cooperation in the matter. On the educational program, President Leslie Wanamaker introduced Byron Halstead, President of Halstead & Mitchell, and Kenneth Newcum and Bill Smith of Remco, Inc., who gave a very interesting and educational talk on water cooled condensers, driers and drier application to the refrigeration system.

• **ALTOONA CHAPTER, Altoona, Pa., Sept. 1**—Reports were heard from Membership, Entertainment and Publicity Committees, and a Safety Committee consisting of Wm. Coleman, T. Hetrick, J. F. Sobieski and V. J. Eckenrode was appointed by President Bender. The meeting was then turned over to the Chairman of the Educational Committee, G. C. MacAlarney who introduced Spencer Anderson, field engineer for the Detroit Lubricator Co. Mr. Anderson, with the assistance of Bob Ryan, presented several wire recordings illustrated with slides, analyzing field service problems and testing of expansion valves, moisture problems, and the effect of various superheat conditions upon coil and condensing unit capacities. After a general discussion of the subjects and problems presented, Mr. MacAlarney on behalf of the chapter thanked Mr. Anderson and his sponsor for their cooperation. Refreshments were enjoyed after adjournment.

• **ARROWHEAD CHAPTER, Riverside, Calif., Sept. 13**—There were 23 members and 4 guests in attendance at this meeting, during which Kendall M. Kline was admitted to the chapter by unanimous vote as an active member. Acting Educational Director Stone introduced Merle Soden of Orange County Chapter, who gave a lecture on the uses, merits and demerits of F-22. There were many questions indicating the interest of the members in the use of F-22 for low temperature work. The prize for the evening—an AP automatic expansion valve—was won by Charles Edwards. Chapter thanks went to Mrs. Wm. Bird and Mrs. Frank Parker who served tasty, fancy shaped sandwiches to the members after the meeting.

• **CENTRAL PENNSYLVANIA CHAPTER, Harrisburg, Pa., August 19**—After all chapter business was completed, Sam Rogers who presided at this meeting due to the absence of the

REMCO INCORPORATED

MAKERS OF *"Cross-Flo"* DRIER-FILTERS

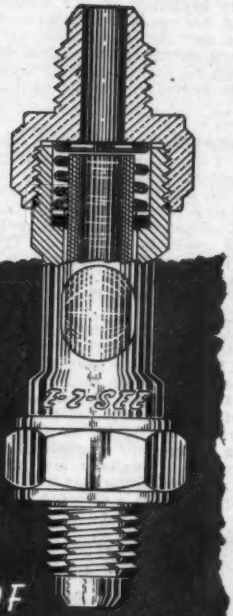
PROUDLY INTRODUCE

THEIR NEW

E-Z-SEE

LEAKPROOF

LIQUID INDICATOR



THE 100% ANSWER TO THE INDUSTRY'S DEMAND FOR A FOOLPROOF LIQUID INDICATOR . . .

- *E-Z TO SEE THROUGH*
- *POSITIVELY LEAKPROOF*
- *PERFECTLY SAFE TO USE*

IT'S E-Z TO SEE THROUGH the tubular high pressure Pyrex gauge glass. Magnifies when filled with liquid to afford far better than normal vision.

CAN'T LEAK BECAUSE the springs maintain just the right amount of force upon the neoprene gaskets, form a positive seal around the glass to compensate for "cold flowing." Refrigerant pressure on gaskets assists springs to make an even tighter seal. The higher the pressure, the tighter the seal.

SAFE BECAUSE glass is protected by unique slotting arrangement in the rugged brass body. Glass actually "floats" in spring compensated neoprene gaskets thus withstands pressures up to 500 P.S.I. with perfect safety.

SIZES—¼", ⅜", and ½", male flare x male flare and female flare x male flare. Literature and prices available upon request.

REMCO

INCORPORATED

ZELIENOPLE, PENNSYLVANIA

Sold by Leading Wholesalers Everywhere

president and 1st vice president, introduced H. H. Hoover of Kold-Hold Mfg. Co. Mr. Hoover explained simple methods for overcoming hot spots in refrigerated trucks and emphasized the importance of the trucking industry in the refrigeration field. He also stressed the point that the trucking firms have only scratched the surface of this phase of the work.

• **CHARLESTON CHAPTER, Charleston, S.C., Sept. 1**—The president reported that F. A. Bailey had resigned from the board of directors, but it was decided to postpone the election of his successor until a later date. Harry Hood accepted his appointment as chairman of the publicity committee. The educational program consisted of a movie entitled "Adjusting Commercial Thermostatic Controls" after which a general discussion was held.

• **CHICAGO WEST TOWNS CHAPTER, Maywood, Ill., Sept. 28**—During the business meeting Charles Ettner gave a report of the State Association Convention held at Springfield, and Ed Ricco was called upon to explain the benefits and function of this Association. Mr. Moerke of Air Reduction Co. gave an enlightening lecture and demonstration on soldering. Sixty-seven members and visitors attended this meeting which was held at Service Parts Company, who sponsored the meeting and also furnished the refreshments that were served afterward.

• **DAYTON CHAPTER, Dayton, Ohio, Aug. 6**—The meeting opened with a report on the Buckeye State Association meeting, given by Mr. Denny. John Beck presented the educational program which started off with a lengthy discussion of a two temperature job being build by Frank Daley. The recording on "Hermetic Units" by R. Olin was then heard.

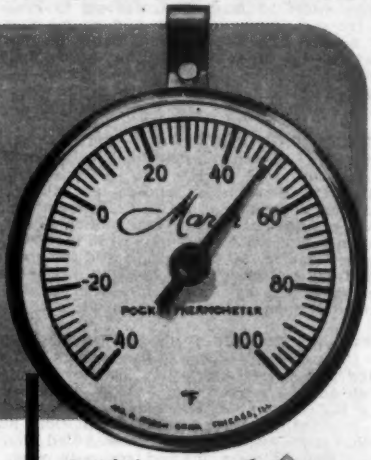
Inasmuch as none of the officers were present at the September 23rd meeting, the meeting was called off and the group decided to sit in on a frozen food demonstration put on by Frigidaire and sponsored by the Ladies Auxiliary. This proved to be very enlightening and judging from the discusion that followed, servicemen seem to show quite a bit of interest in frozen foods.

• **FAIRFIELD COUNTY CHAPTER, Bridgeport, Conn., Sept. 13**—During the business session, which was quite short, plans for the convention in Boston were discussed. Also a new member was accepted. Directly after the meeting the annual mystery gathring was held. Members and their friends attended. Paid entertainment held the attention of all present after which beer and other refreshments were served. A good time was had by all.

The Blue Ridge Chapter held its annual banquet and dance recently at the Elks Club in Roanoke. Guest speaker was W. E. Booth of Richmond, Va., International Sergeant-at-Arms, who offered many worthwhile suggestions for the good of the chapter. After dinner, prizes were drawn—the grand mystery prize being two ten dollar bills neatly wrapped in a box. Charlie Etheridge was master of ceremonies. Officers shown in the picture are, standing, left to right—C. H. Kessler, Board Member; R. S. Templeton, Past President; A. J. Gregory, Sergeant-at-Arms; J. M. Stull, Board Member; R. T. Nolen, Board Member; and W. G. Andrews, Board Member. Seated, left to right—C. E. Etheridge, Board Member; W. M. Bryant, 1st Vice-President; Walter Booth, State President; H. S. Beumer, President; and I. Jones Keller, Secretary-Treasurer.

Handiest and best Pocket Thermometer ever!

THE *New* MARSH POCKET THERMOMETER



It's watch-like in size and style. Easy to read in poorest light. Highly accurate. Has "Recalibrator slide" to keep it accurate. Rugged —in handsome, polished case of durable, heavy-gauge stainless steel. Unbreakable crystal. Sold at an unbelievably low price.

No guessing at error caused by handling or room temperature as with hard-to-read glass tube thermometers. Just place this instrument in freezing compartment, close refrigerator until temperature registers, open refrigerator and instantly read temperature on clear, legible dial.

This is a handy addition to every refrigerator serviceman's kit, developed by Marsh out of 80 years' experience in precision-instrument making.

JAS. P. MARSH CORPORATION
DEPT. Q, SKOKIE, ILLINOIS

Actual size above (2-3/16" diam.) Typical Marsh value. $2.00

Clip holds Thermometer in pocket; also serves as hanger when used in refrigerator. Clip swivels to fit any position.

If ever knocked out of adjustment Thermometer has this "Recalibrator slide" for quickly correcting it to a thermometer of known accuracy.

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• FLORIDA WEST COAST CHAPTER, Tampa, Fla., Aug. 12—It was voted that a better effort be made by members to keep an interest in the chapter and to increase its membership so that attendance at the meetings might improve. The educational secretary gave a lecture on hermetic refrigerating machines, enjoyed by the 15 members present.

• FORT WAYNE CHAPTER, Fort Wayne, Ind., Sept. 22—Nomination for the regional convention to be held in Chicago was held, with Otto Popp being chosen as delegate and Harold Braun, alternate. The members' wives present elected temporary officers, thus forming a Ladies Auxiliary in the Fort Wayne Chapter. All present enjoyed the singing of the sixteen member barbership singers who were led by Bill Miller. The register showed 30 men and 25 women in attendance.

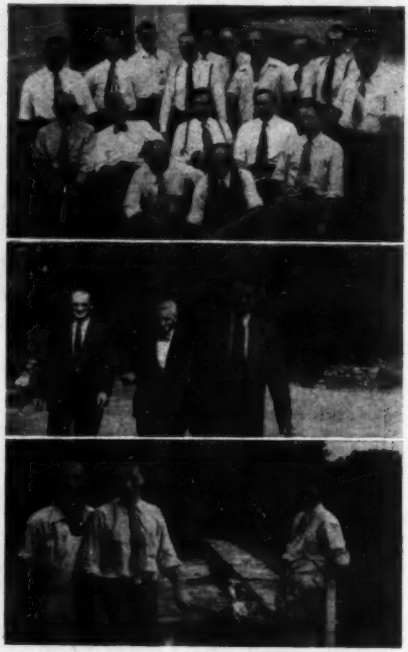
• FOX RIVER VALLEY CHAPTER, Fond du Lac, Wis., Sept. 1—Two new members were voted into the chapter—they are Roy Zuege as an active member, and Paul W. Heckroth as a junior member. Ed. Schroeder reported on a recent serious methyl explosion at Sheboygan, Wis. One man was killed and three persons were injured seriously when leaky fumes were ignited with a resulting explosion that wrecked a three-story concrete building. Otto Maki and Bud Craw conducted a "Quiz Test" which proved very entertaining and educational. Refreshments were served.

• GARDEN STATE CHAPTER, Newark, N. J., Sept. 23—Seventy-five chapter members and guests heard Dr. W. O. Walker, Director of Research, Ansul Chemical Co. of Marinette, Wis., talk about "Solids in Oil-Refrigerant Mixtures." All present agreed that Dr. Walker had a lot of interesting information and presented it in a very interesting manner. He told of sludges in refrigerating systems and the action of methyl chloride on aluminum, and then conducted a question and answer period after his talk. Sergeant-at-Arms Bill Mayer gave a question box to the chapter and explained its use. The door prize—a flaring block donated by W. I. Freeman and Company—was won by Thomas Cardaci. Doughnuts and coffee were served after adjournment.

• GRANITE STATE CHAPTER, Manchester, N. H., Sept. 13—The meeting was preceded by a supper attended by 24 members. New officers installed for the coming year are: J. Lawrence Hall, President; Einar Kolvig, 1st Vice-President; Henry Daniels, 2nd Vice-President; Harold Wentworth, Secretary; Elmer Soderberg, Treasurer; and Thomas Cote, Sergeant-at-Arms.

• GREENVILLE CHAPTER, Greenville, S. C., Sept. 8—A good discussion was held concerning the formation of a refrigeration code to be introduced in Greenville. Wayne West and Dick Ryer will attempt to have a proposed code drafted by the next meeting so that members might study it.

• HEAD OF THE LAKES CHAPTER, Duluth, Minn., Sept. 14—A good turnout of 45 members and guests were present to hear the guest speaker of the evening, Al Murray of Mills Industries, give an interesting talk on Mills compressors and condensing units. He also answered many questions put to him about his company's products. After the meeting, lunch and refreshments were served through the courtesy of Refrigeration Wholesalers.



Pictured in the top photo are the officers of the New England States Association who met in Providence, R.I. on Sunday, September 19th, to discuss and arrange final details of the Boston conference. Host to the affair was Bill Rallston, past president of the Providence Chapter. The center picture shows the Worcester representatives arriving, who are, left to right, Director Foley, Bill Tierney and Bob Davis. The bottom picture shows one of the steaks that were provided being cooked over a charcoal fire by Lee Wallace of New Haven, new chairman of the Code Committee. Bill Rallston, dressed for action, is standing right behind him, but the man with the gloves we are unable to identify.

Photos by Chas. C. E. Harris

• INDIANAPOLIS CHAPTER, Indianapolis, Ind., Aug. 10—A good deal of discussion was held regarding the State Convention to be held in October, and Noah Mohr was elected delegate and Elwood Wulf alternate to that convention. On the educational program, recordings on Safety by George Schuld were played.

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• KEY CITY CHAPTER, Dubuque, Iowa, June—R. Mueller, appointed to follow through on a Hampton, Iowa, explosion some months ago, read a letter from the County Attorney at Hampton to the effect that this accident was not a result of refrigeration equipment. It was decided that Mr. Mueller would contact state newspapers for a correction of this error. The following officers were elected for the coming year: A. E. Knapp, President; Curtis Breed, Vice-President; T. H. Glass, Secretary-Treasurer; W. L. Nestor, Asst. Secy-Treas.; R. Pier, Sergeant-at-Arms; C. J. Brashaw, Educational Chairman (with Bob Mueller, Gene Geisler and Milt. Pauley as assistants); Stan Jones, Entertainment Chairman (with Bert Render as assistant). R. Mueller was appointed to the Board of Directors to fill vacancy of T. H. Glass. Speakers for the evening were P. D. Domke, Robert Rowland and C. A. Dickson, all of Mueller Brass Co.

• LA CROSSE CHAPTER, La Crosse, Wis., Aug. 6—An entertainment committee consisting of Emmet Flick, George Brenstein, James Volden and Stewart Crogan was appointed by President Roellig. The educational program was a recorded lecture "Hermetic Refrigerating Machines," followed by a discussion and refreshments.

At the September 3rd meeting, final plans were completed for a forthcoming annual banquet to be held early in October.

• LONG BEACH CHAPTER, Long Beach, Calif., Sept. 2—There were 42 members, 1 candidate, and 14 visitors present at this meeting. The educational round-table was called to order by Educational Chairman Tom Renzi who introduced Henry Howard and Presley Clark as arbitrators. The session was devoted to the "Service Call." Visitors introduced included President Bob Chambers, Past President Everett Brown and Earl Brown of the Hub Chapter; Past President Jim Robinson and Jack Allen of the Orange County Chapter, past member Les Taylor; F. J. Stander, George McCowan, W. F. Curry, Charles Marinoff, John Osborne, Henry Courvell, G. H. Perry, Ernest Lynch and Fredrick Sykes of the Chamber of Commerce. A successful wiener bake and beach party was reported on with many comments being made. Twenty-five members attended the affair and a fine time was had by all. On the educational program, Fredrick Sykes of the Chamber of Commerce gave a very interesting talk on the modern trends in California and especially Long Beach. A raffle was held with prizes going to Lee Bradford, Al Jackson and Paul Travers who won the puppy stool. Doughnuts and coffee were served by Ed Murphy and his assistants.

• MIAMI CHAPTER, Miami, Fla., Aug. 25—An interesting talk was given by Mr. Louis on Labor liens or mortgages and how they are executed. A questions and answers period was then held by Educational Chairman Dolard, for whom a blackboard was procured to aid him in this work.

The September 22nd meeting was rudely interrupted by a very untame gale out of the Caribbean Sea, and while it was kind enough to skirt Miami by a few miles, residents nevertheless knew it had visited near them.

• MIDLAND EMPIRE CHAPTER, Bilings, Mont., Sept. 14—After a summer adjournment with no meetings held in July or August, the first meeting of the fiscal year was held on this date in the basement of the Billings Commercial Club with 12 members in attendance. Election of officers was held as follows: W. Larson, President; J. Vranish, Vice-President; N. Sulenes, Secretary-Treasurer; and R. Howatt, Sergeant-at-Arms. New members elected to membership were Tom Chapman, Frank G. Joe and R. Crawford. The educational program for the evening consisted of the slide-recordings, "Reverse Cycle Refrigeration" and "Hermetic Refrigerating Machines." Much interest was shown in Paul Reed's discourse on reverse cycle and a varied discussion on the subject was held. Refreshments were then served.

QUINCY CHAPTER RECEIVES CHARTER

The newest chapter in Illinois received its charter on September 20 from International Director Floyd Lilley of Chicago. Among the visitors attending the chapter presentation was E. Riccio, chairman of the new chapters committee for the Illinois Association.

Pictured in the upper photograph from left to right are Lawrence J. Zimmerman, president of the chapter; Jack White of the Republic Electric Co., Davenport, Iowa; Lonnie Mathies, U. S. Electric Co., Springfield, Ohio; Forest Olmstead, Dennis Refrigeration Supply Co., Omaha, Nebr.; Dick Resicki, Republic Electric Co., Davenport, Iowa; and Floyd Lilley, Chicago, International R.S.E.S. Director.

The representatives of the wholesalers pictured with President Zimmerman and International Director Lilley provided the banquet which preceded the charter presentation.

The bottom picture shows the members and visitors of the new chapter.

• PHILADELPHIA CHAPTER, Philadelphia, Pa., Sept. 10—Plans were made for the annual banquet and an intensified educational program was launched. Dr. Edgar S. Ross of the Sun Oil Company, conducted the educa-

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tional portion of the meeting by holding an open forum on the subject of oil problems in the refrigeration system. Interesting and spontaneous discussions were had on the topic and Dr. Ross' knowledge and wit were thoroughly appreciated.

• PROVIDENCE CHAPTER, Providence, R. I., Sept. 3—President Vieira appointed a Membership Committee consisting of Charles Barone, Chairman, James Olean and Bert Ohlson, who pledged to take immediate action on any future applications. Junior members approved were Paul J. Desjarlais, Francis Beard and John I. Murray. Associate member approved—Henry J. Dziadosz. Active members approved—Walter V. McFadden and S. U. Norton.

• QUINCY CHAPTER, Quincy, Ill., Aug. 16—The subject of individual membership in the State Association was discussed and it was voted upon to let each member decide for himself as to whether or not he wishes to join. Various members signed application. The balance of the meeting was taken up by chapter business.

• ROCHESTER CHAPTER, Rochester, N. Y., Sept. 16—Sixty-seven members were present at this meeting. Plans were made for attending the convention in Boston on October 8, 9 and 10. A large delegation planned to attend. Educational Chairman L. Nohle then presented Mr. Brown and Mr. Packtor of the Tenney Engineering Co., who gave an interesting and informative talk and demonstration on expansion valves and other refrigeration mechanisms. A discussion period followed. Plans were also made for a clambake on October 17th for members and their friends. Refreshments were enjoyed after the meeting.

•SCIOTO CHAPTER, Marion, Ohio, Sept. 9—Speaker for the evening was George Schuld, Sr., International Safety Chairman, whose talk covered the hazards connected with refrigerants and refrigeration equipment. He stressed the toxicity, inflammability and critical pressures of the common refrigerants, and read a list of "do's and don'ts" he had compiled. He also read reports on several recent accidents and offered suggestions to prevent them. Two men were required to carry the material Mr. Schuld brought with him to Marion for his speech. President Osmun and all members present pledged themselves to back Mr. Schuld in every way possible to bring about success of his safety program. Visitors at this meeting included 12 fire fighters, 1 police representative, 2 safety men and 1 U. S. Army lieutenant. International Director Earl Yockey and Mr. Baumgardner of Cleveland were also guests. The forming of a bowling team to play in a proposed northern Ohio league was open for discussion.

• SEATTLE CHAPTER, Seattle, Wash., Sept. 7—Four members present from Vancouver Chapter were introduced to the audience. They were Bill MacMillan, Bert Paton, Fred McDonald and Bob McGilver. Two members from Tacoma were also present—K. T. Dawson and Burt Powers. The educational program was an outstanding one. O. C. Yates introduced Wayne Mason from Pacific Scientific Company, who gave a very thorough discussion on Sterilaire, a form of ultra violet germicidal ray very suitable to use in refrigeration practices. With the use of germicidal ray it is possible to hold meats at slightly higher temperature causing less shrinkage and more profits. Due to excessive amount of ozone generated by this lamp during the first 100 hours of operation, it is not advisable to install lamps near meats, etc., until they have burned for four days. Also around fish storage it is advisable to double the number of lamps for protection. It is not recommended for use in homes since it is dangerous to the eyes. The unit purifies the air in walk-in boxes, dilution of bacteria in air ultimately purifies all air in the box and has practically no effect on vegetables. Average life of lamp is 4000 hours though in rare cases have been known to be efficient up to three years. Mr. Mason also demonstrated the use of an ultra violet mineralite in the use of detecting counter-

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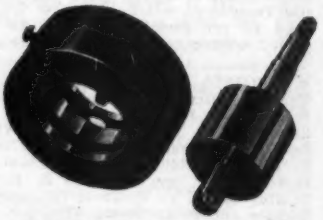

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felt bills; also against various types of rocks showing phosphorescent display from various minerals. A coffee session completed the evening.

• SUNSHINE CITY CHAPTER, St. Petersburg, Fla., Aug. 5—After chapter business was completed, the meeting was turned over to M. Baird, Chairman of the Educational Committee, who gave an enlightening lecture on "Tubing Surface Versus Heat Load Dissipation." This was enjoyed by all present.

• TOLEDO CHAPTER, Toledo, Ohio, Sept. 8—A detailed report on the Buckeye State Association meeting held recently was given by Mr. Van Vorce. Various other chapter matters were discussed before adjournment. No educational program was reported.

• TRENTON CHAPTER, Trenton, N. J., Sept. 15—Attendance at the meeting was 29 members, 7 officers and 3 guests. Chairman Beemish of the Ordinance Committee gave a complete report of what had been accomplished toward the formation of a city code. It was announced that three chapter members were successful in the certificate examination taken last March. They are Alvin E. Gunsche, Henry Van Langen and George H. Wood, Jr. The 50-50 club drawing was awarded to Michael Wargo.

• TWIN CITIES CHAPTER, Minneapolis, Minn., Sept. 14—Most of the evening was occupied with the reports of chapter activities. The educational portion was a demonstration and talk given by Mr. Van Kleef on the Tempotool which is a new type of tool used in refrigeration work. This was received with much interest by the audience.

• VIRGINIA CHAPTER, Richmond, Va.—Chapter officers for the 1948-49 term are: B. A. Hauck, President; A. I. Elliott, 1st Vice-President; H. M. Rosemond, 2nd Vice-President; H. J. Sharp, Secretary; E. G. Martin, Treasurer; and R. E. Seay, Sergeant-at-Arms. Directors for one year—E. E. Kell, P. B. Bruffey and E. L. Parsons; two years—R. W. Lampie and S. L. Young.

• WESTERN MASSACHUSETTS CHAPTER, Springfield, Mass., Aug. 24—A nominating committee consisting of Carl Page (Chairman), James Cargel, Bradley Bailey, Philip Eiardi and Louis Chmiel, was appointed. Four motion pictures were shown at the close of the business session. They were "Live and Let Live," "Outdoor Life," "Railroad," and "Know Your Money."

• WINNIPEG CHAPTER, Winnepeg, Man., Sept. 17—A small attendance at this meeting did not prevent an interesting discussion from being carried on. The recent acceptance of refrigeration as a regulated trade under an apprenticeship system was discussed. The fulfillment of this long standing need has brought about questions of the apprenticeship standing of all refrigeration men. One member was delegated to make inquiries direct with the apprenticeship director and advise the chapter through the Secretary all details of registration for journeymen and enrollment of apprentices in trade schools set up by the government. A letter from the Inter-Provincial Assn. requesting the educational requirements of the chapter for the coming year was taken up and several constructive suggestions and criticisms were presented. The primary need of live speakers was stressed, with movies playing a secondary part in the educational program. The suggestion of one member that the chapter draw upon the talent of its membership for talks was well received but arrangements were held over until word could be received from the Inter-Provincial Association.

• YOSEMITE CHAPTER, Modesto, Calif., Aug. 18—The regular business of the meeting was postponed and the meeting turned over to International Treasurer M. R. Hanks who presented the charter to the chapter and also presented the members with their membership certificates.

Ladies Auxiliary

• CENTRAL ARIZONA AUXILIARY, Phoenix, Ariz., Aug. 10—New officers of this auxiliary are: Mrs. Lois Rardin, President; Mrs. Lillian Bender, Vice-President; Mrs. Marian Sigafoos, Secretary; Mrs. Doris Marlowe, Treasurer; and Mrs. Peggy Smith, Sergeant-at-Arms. Mrs. Bertha Abbiehl was appointed Membership Chairman, and Mrs. Crystal Sommers and Mrs. Eldora Hammerstedt were chosen as the Entertainment Committee.

• KANSAS CITY AUXILIARY, Kansas City, Mo., Sept. 16—It was decided to postpone the election of officers until the December meeting, inasmuch as some of the members will be attending the Chicago convention at the time of the November meeting. Announcement was made that donations to the Put and Take box are needed from members who have not yet contributed. Katherine Jones donated an angel food cake which was raffled off and won by Kathryn Andrews. Refreshments for the next meeting will be handled by Ruth Ferguson and Hazel Brown.

• OIL CAPITAL AUXILIARY, Tulsa, Okla., Aug. 24—The ladies met for dinner before the start of the business meeting. A discussion was held about a masquerade party to be held in October, and a committee for this purpose will be appointed. The meeting was then turned over to the Entertainment Committee who had planned a pink and blue shower, honoring Lucille Hammond.

• SCIOTO AUXILIARY, Marion, Ohio, Sept. 9—Guests at this meeting were Mrs. Earl Yockey and Mrs. L. E. Bailer. Plans for the charter presentation were discussed and the date of October 21st chosen. The Ohio Public Service Company sent President Morse a list of movies which they show at clubs and organizations. The auxiliary selected "Ironing Can Be Easy" and "Don't Blame it on the Oven" to be shown at future meetings. Games were played after adjournment with prizes going to Avalon Radcliffe, Mildred Davids, Ellen Knachel and Betty Whittington.

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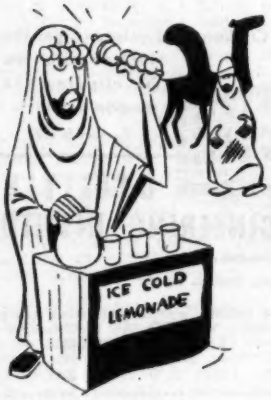

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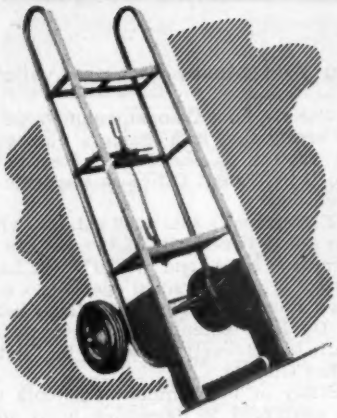

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Copies of the American Standard on Cast-Iron Flanges and Flanged Fittings for Refrigerant Piping (Class 300), B16.16-1948 may be obtained from the American Standards Association, Incorporated or from the American Society of Mechanical Engineers at 45 cents each.

★ ★ ★

R.S.I. Celebrates 20th Anniversary

REFRIGERATION Service, Inc., refrigeration equipment wholesalers in Los Angeles, Calif., celebrated their 20th aniversary in September with the good wishes of their many friends for continued growth and success.

One of the few wholesalers in the entire country who can boast of 20 years of service, they have the distinction of being the oldest on the West Coast. During its first nine years in business, the company operated as a service company in addition to the wholesale business, but in 1937 discontinued service and devoted all facilities to wholesaling.

The company has continued to grow and expand until now it is not only the oldest but also one of the largest on the West Coast.

★ ★ ★

Fred C. Kramer Company Moves to New Location

FRED C. KRAMER Company, Chicago, wholesaler of plumbing, heating and refrigeration supplies has moved from 212-214 N. Jefferson Ave., into new and larger quarters at 128-138 S. Paulina Street. In construction for almost nine months, the new Kramer building affords 27000 sq. ft. space, is centrally located and completely modern throughout.

Now in its 30th year of service to the Plumbing, Heating, Refrigeration and Air Conditioning trade, Fred C. Kramer Co., has steadily expanded to keep pace with the needs of the trade. This constant growth has made it necessary to move to larger quarters on five different occasions.

In its present location, and with increased facilities for serving the trade, the company is enlarging its stocks, inaugurating a new city pick-up and delivery department, and planning the publication of a new catalog.

★ ★ ★

Du Pont Makes Patents Available

THE Du Pont Company announced recently that it is listing a number of its patents on the Patent Register of the U. S. Patent Office as available for licensing.

The company said 4260 patents, which are about two-thirds of the patents the company owns, and which cover many phases of its diversified operations, have been submitted. The first official listing of Du Pont patents is expected to appear in an early issue of the Patent Office Gazette.

Study of the company's patents will be continued to determine what additional listings may be made from time to time, and patents not included in the present registration are not necessarily withheld from consideration for licensing. The present list was compiled only from patents granted since January 1, 1933, as those with only a short remaining life were not considered. The life of a patent is 17 years.

The Public Register of Patents Available for Licensing has been in effect since June, 1945. Du Pont pointed out that registration marks no particular change in its policy as, over the years, the company has licensed many of its patents. It noted that registration appears to be a convenient and practical method of bringing patents to the attention of industry.

★ ★ ★

Nelson Co. to Represent Henry Valve Co.

THE Henry Valve Company, Chicago, announces the appointment of A. J. Nelson Company of Denver, Colorado, as Factory Sales Representative for the mountain states territory. This territory includes: Montana, Wyoming, Colorado, Utah and New Mexico.

BEN-HUR Dealers Enjoy

A 1-TO-1 SALES ADVANTAGE

in FARM and HOME FREEZERS

18 cubic foot
Model 2187

• Choice of 4 popular models to match every family need.

9 cubic foot
Model 197

12.5 cubic foot
Model 2127

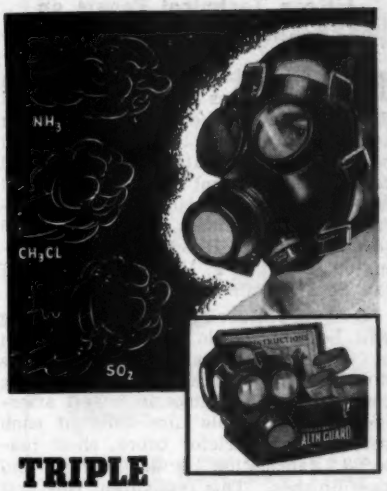
6 cubic foot
Model 167

● You turn prospects into customers faster with the BEN-HUR Freezer franchise! You can offer *every* prospect COMPLETE-LINE-CHOICE . . . a BEN-HUR freezer that matches *exactly* the need of any family in your community — with 6, 9, 12.5, and 18 cubic foot cabinets that hold from 300 to 900 lbs. of frozen food.

Each of the FOUR popular BEN-HUR Models takes the lead in modern styling, convenience features, food freezing and storage efficiency — and operating economy. Table-top designs, greater capacity in less floor space, special safety hardware, counter-balanced covers, "slamless" locks, hermetically sealed insulation, separate freezing compartments — these and many other features make BEN-HUR selling easier . . . And in the home they promise customer enthusiasm through longer years of food savings and better meals.

Help EVERY family "SLASH THE HIGH COST OF EATING" with a BEN-HUR Freezer. . .

BEN-HUR MFG. CO.
Dept. RS, 634 East Keefe Avenue,
Milwaukee 12, Wisconsin



TRIPLE PROTECTION with CESCO's 605 Fume Kit

CESCO's Healthguard Fume Kit (No. 605) offers *triple protection* to refrigeration servicemen. Quick-change filter cartridges assure safety against ammonia, methyl-chloride and sulphur-dioxide fumes . . . *all in one convenient carrying case.*

The soft molded rubber face-piece of the fume mask, and the adjustable headgear assure a gastight, comfortable fit for every wearer. Large safety glass lenses give perfect visibility.

The CESCO Healthguard Kit provides *economical* protection because it is *moderately* priced.

Write for CESCO'S *No. 605 Safety Bulletin for complete information*

CHICAGO EYE SHIELD CO.
2346 Warren Boulevard
Chicago 12, Illinois

CESCO
FOR SAFETY

Fifteen Technical Papers on ASRE Annual Meeting Program

FIFTEEN technical papers, covering such subjects as food freezing, design developments in household and small commercial refrigerators, and unusual refrigeration applications, are scheduled for presentation at the 44th Annual Meeting of The American Society of Refrigerating Engineers, December 5 through 8, at the Hotel Statler in Washington, D. C., C. F. Holske, president of the Society, announced recently.

A novel feature of this year's meeting will be a domestic refrigerator forum at which engineers from the various household refrigerator manufacturing companies will engage in a full afternoon's round table discussion of such subjects as restrictor tubes, shelf material, fabrication developments, and new finishes. This innovation was first introduced at the Society's Spring Meeting this year where it met with unqualified success.

During the ASRE Welcome Luncheon on the first day of the meeting, a very prominent but as yet unannounced, speaker will talk to the refrigerating engineers on a political or business topic.

A full program of social and sightseeing activities has been planned by the Baltimore-Washington Section of ASRE, host for the meeting. An informal party is planned for one evening with top-notch entertainers scheduled to perform. Following the usual ASRE tradition there will be a cocktail party and dinner-dance during the second evening of the meeting. Sightseeing trips to many of Washington's famed buildings and points of interest are scheduled as well as inspection trips to several plants. These will be conducted on all three days of the meeting.

New officers of the Society will be installed on Wednesday, the final day of the meeting. Those nominated and who will presumably become next year's officers are; President—Burgess H. Jennings, head of the department of mechanical engineering, Northwestern University; Vice Presidents—J. G. Bergdoll, plant superintendent, York Corporation, and Edward S. Simons, consulting engineer of San Francisco, and Treasurer —Paul B. Christensen, vice president of Merchants Refrigerating Company.

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SNAP-ON COPPER TUBE CLIPS
FIT SNUG-HOLD TIGHT - while both hands are free to work
VAN type HANGERS
Use for extra neat installation—made of all copper for tube sizes ⅜", ½" & ¾" O.D. and pipe sizes ¾", ½" & ¾"
STRAP HANGERS
Made of ½" brass strip—Adjustable for all sizes of tubing or pipe, ¾" O.D. and up.
BRASS STAPLES
Handy for a score of uses, especially for radiant heat installations.
A MACO exclusive in new-design tube straps that "snap" on and hold by themselves, leaving both hands free. Available for ¾" thru 2⅛" O. D. tube sizes.
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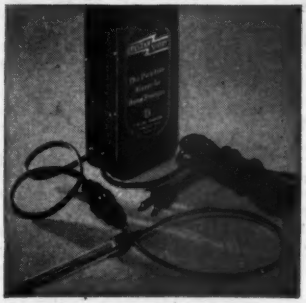
MADISON PRODUCTS COMPANY
EAST GREENWICH, R. I.

These and other MACO products are available through leading wholesalers, everywhere. Literature and prices available upon request.

FREEZER SENTRY



A PROFITABLE

"Push Over"

SALE

ON EVERY FREEZER SERVICE CALL

● Every owner of a home freezer needs this signaling device to insure quick warning of mechanical failures. Every day more freezers are being serviced in your area. You do the servicing. You know the owners. They need the Freezer Sentry.

Here is Why You Should Sell the Freezer Sentry

A package item. Installed in two minutes.

●

Positive action. No thermostat. A drop of mercury makes the contact.

●

Battery operated. Trickle charger insures 5-year battery life and 100 hours buzzer operation.

●

An extra good profit margin for you.

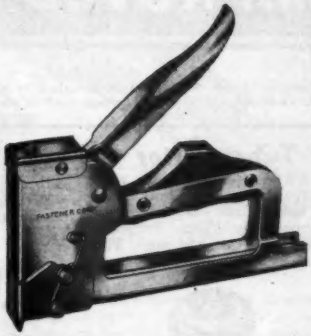
Immediate delivery. Write today for descriptive material and price sheet.

JEWETT ASSOCIATES

1053 MAIN ST. BUFFALO 8, N. Y.

REACHES OVER AND IN

Tacks Fast And Sure



IT'S THE NEW DUO-FAST GASKET TACKER

with the Extended Lip

- For tacking hard rubber gaskets and tacking over beadings.
- One hand operates tacker with speed and accuracy—the other hand is free to hold work.
- Drives medium or heavy gauge staples in ¼", 5/16" or ⅜" lengths.

EQUIPPED WITH THE NEW

Jiffy Jaw

The DUO-FAST Jiffy Jaw is something specal—it takes just a second to relieve a jammed conditon—Click it's off—Click it's on—no delay and on with your production.

Call Your DUO-FAST *Specialist*

Your DUO-FAST Specialist is a good man to know—he may have ideas to speed up your production and cut your costs—Write for the name of the man in your territory.

FASTENER CORPORATION

846 Fletcher St. Chicago, Illinois

NEW AND IMPROVED EQUIPMENT

Information in this department is furnished by the manufacturer of the article described and is not to be construed as the opinion of the Editor.

Tube Cutter

A NEW tube cutter with "free wheeling" ball bearing action has just been announced by The Imperial Brass Mfg. Co., Chicago. The cutter is designed for use

with copper, brass, aluminum, Bundy steel, block tin and lead tubing, hard or soft temper, and will cut all sizes from ⅛" to 1" outside diameter inclusive.

One of the outstanding features listed for this tool is its "free wheeling" action. Ball thrust bearings are built into the tool to provide extreme ease of operation and to make possible speedy size adjustment.

Tubing being cut rolls on rollers, adding to ease of operation. There is a patented flare cut-off groove in the rollers which makes it possible to remove a cracked flare without waste of tubing.

Another new feature is the retractable locking reamer for reaming tubing after it is cut. The reamer folds out of way when not in use, and overall length of tool is only 4½". Feed mechanism of tool is enclosed so that threads are protected against dirt and damage. Body is high strength aluminum alloy and tool weighs only 6 ounces, making it exceptionally easy to handle.

The new cutter is identified as No. 274-F, and full information is available from the manufacturer in Bulletin No. 367.

De-frost-it

PARAGON Electric Company, Two Rivers, Wisconsin, recently announced 'de-frost-it,' a new home appliance that converts any home electric refrigerator to fully automatic nightly defrosting in less than a minute. Easy to install, the refrigerator cord plugs into the unit, and the 'de-frost-it cord into a convenient receptacle.

'De-frost-it' automatic nightly defrosting does away with hand defrosting, keeps foods fresh longer and prolongs the life of the re-

frigerator. An exclusive feature, "adjustable defrosting" makes it easy to set the right defrosting cycle for any refrigerator regardless of age, climate or humidity. Another feature, "skip-defrost" interrupts the defrosting cycle for storing ice cream or other frozen desserts over night.

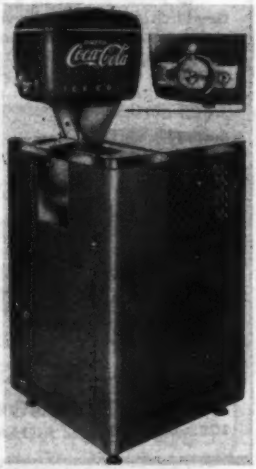
Once set to the approximate time of day, the unit will automatically start the defrosting cycle after 1 a. m. each morning. The circuit to the refrigerator is interrupted just long enough to allow the slight daily accumulation of frost to melt away. Refrigerator temperature is not raised excessively and as a general rule will not exceed the differential setting of the refrigerator thermostat. Thus the short defrosting period and low temperature rise will not thaw frozen foods stored in the evaporator.

Underwriter's Laboratories approved, the unit measures 3⅛x2¼x5½" and the white enamel finish is baked on a metal case. The red knob provides a spot of color.

Available through wholesalers, the 'de-frost-it' lists at $9.95 and is packed 6 to the standard dealer package. Each package of 6 contains a complete merchandising campaign including counter display, circulars, window streamers, news ad mats and other advertising material.

Dispenser

THE Perfex dispenser is an all-steel, completely self-contained dispenser for serv-



SAFE . . . LEAK-PROOF . . . EASY TO INSTALL . . .

***Fully enclosed* GASKET**

The pliable gasket is enclosed on three sides by a brass housing, prevents the gasket from creeping.

***Lapped* GLASS**

Lapped glass surface makes a fourth side to fully enclose the gasket making a perfect seal. See inset above.

Ask to See the LIQUID EYE at Your Jobber

PERMANENT COPPER FLARE INSERT simplifies direct installation on dryers or receivers. Eliminates use of extra flare nuts thus fewer connections are necessary.

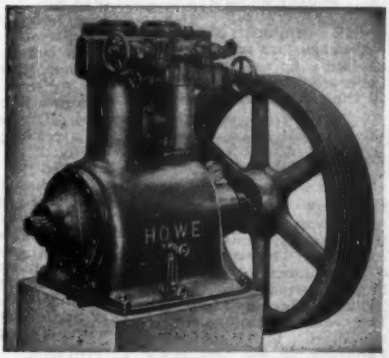
DOUBLE PORT
ELIMINATES PRESSURE DROP
POSITIVE REACTION OF INDICATOR
FLOATING PYREX TUBING INSURES SAFETY
PLIABLE GASKETS, IMPERVIOUS TO REFRIGERANTS AND OIL

ALLIN MANUFACTURING COMPANY • 1153 W. GRAND AVE. • CHICAGO, ILL.

HOWE REFRIGERATION KNOWN THE WORLD OVER

HOWE-TO HAVE TROUBLE FREE REFRIGERATION!

"I've never seen any machine that operated so trouble-free." Here's proof . . . from a user . . . of an important advantage Howe Refrigeration Equipment offers. Trouble-free operation cuts risk of food spoilage. Saves money . . . time. Let Howe's 36 years of specialization solve your refrigeration problems with equipment *basically* right. Howe machines *give less trouble . . . keep running longer*. They're *designed* to do that. Inquiries invited.



Howe-Conditionaire Unit Cooler

Ammonia compressors 2 to 150 tons; self-contained automatic ammonia units; methyl and Freon condensing units; shell and tube condensers; brine and water coolers; unit coolers; fin coils; locker freezing units; air conditioning (cooling) equipment.

HOWE ICE MACHINE CO.

2825 Montrose Ave., Chicago 18, Illinois • Distributors in all Principal Cities

EXCLUSIVE REFRIGERATION EQUIPMENT BUILDERS SINCE 1912

ing draft Coca-Cola. It is mechanically cooled, including the Dole dispenser, and measures 26½" wide by 28½" deep by 42" high to the serving counter.

The refrigeration is by means of "lift-out" assembly, including a ½ h. p. hermetic condensing unit. The first drink is always 40° or less, it is said.

A Bastian-Blessing carbonator with controls, provides carbonated water containing a uniformly high gas content, according to the manufacturer.

Accessories are available, consisting of a paper cup dispenser and a combination tally counter and lock for the Dole unit. The counter is useful in checking sales and controlling free drinks, substitution, etc. The lock prevents unauthorized use. Both of these accessories conserve profits and are of especial interest to multiple unit operators.

In using paper cup service, no washing or sterilizing facilities are required other than for keeping the unit itself in sanitary condition.

The Perfex unit is made and guaranteed by The Bastian-Blessing Company, Chicago, Illinois, and literature will be sent by them upon request.

Dehydrators

FINE Products Company, Chicago, has recently been advised by Underwriters' Laboratories, Inc., that tests on their Rapid Refillable De-

hydrators have been completed and their use on refrigeration systems has been approved. The whole-hearted acceptance of these new Rapid Dehydrators by the industry during these past four years led to their being submitted to Underwriters' Laboratories for this test.

Pressure tests of 1250 pounds per square inch were applied to the shells, and joint areas were tested at 500 psi with no leakage indicated.

These dehydrators being the only dehydrators, according to the maker, with removable inlet and outlet screens, their scientific design and sound construction were commended by Underwriters' Laboratories.

New labels are being prepared showing the approved Underwriters' Laboratories listing.

Coin Meter

INTERNATIONAL Register Company, Chicago, Ill., has announced production of a new low-priced coin meter designed for use in rental of

washing machines, irons, dryers, refrigerators, radios, televison sets, evaporative coolers, air conditioning units, fans, hot plates, etc.

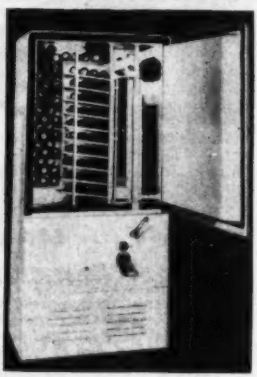
Especially designed to handle a wide variety of minute timings, it can collect a quarter for every 5 minutes, 10 minutes, etc., up to 60-minutes. The meter operates on quarters only. Timings can be changed in less than three minutes by anyone, merely by exchanging timing gears which requires only the use of a screwdriver. The meter accommodates $40.00 in quarters. Prepayment capacity is 1 to 23 quarters.

The case is constructed of 21 gauge drawn steel, strongly reinforced, and is equipped with a special heavy duty lock.

Vend-Rite

FEATURING a gravity feed and manually-operated dispensing mechanism, the new all-metal Vend-Rite bottle beverage vendor just introduced by the Vend-Rite Company, Madison, Wisconsin, provides a positive method for vending standard round six and seven-ounce bottles.

No motor is used for feeding and complicated mechanisms have been elimi-



nated. Since the operation of the handle automatically locks the conveyor, only one bottle can be delivered for each coin inserted. To operate the machine, the customer simply drops a coin in the slot and pushes down the lever. The slug-proof coin mechanism automatically ejects magnetic slugs.

Unit construction adds greatly to the utility of the machine. All parts of the hermetically sealed refrigerating unit are completely protected, and operation is quiet and automatic. Fiberglass insulation is used throughout. The entire refrigeration assembly can be easily removed and replaced without the aid of a refrigeration serviceman.

If necessary, the coin mechanism, the shelves, and the conveyor system can be removed and replaced, because they, also are self-contained units.

Charging Hose

JARROW Products, manufacturer of refrigerator door gaskets and refrigeration servicing equipment is introducing a new "Speed-Angle" charging hose, designed to speed up the work of charging and purging refrigerating systems.

Incorporating a new innovation in coupler design, the

MINI-VOLT

Instantly read voltages right off dial. 65 to 660 v. A.C. Also D.C. Virtually burnout-proof. Guaranteed for 10,000 hours' operation. Plastic case. 12" flexible test leads. *And only $2.75 list!*

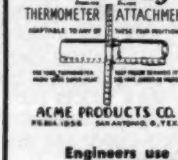
- **Not only distinguishes between 110, 220 etc. volts, but measures line voltage close enough to show up to 3 or 4 volt drop between meter and load terminals on 110 v. line.**
- **No refrigeration serviceman need now be without definite knowledge of whether faulty operation of motors, magnetic valves, etc. is due to improper terminal voltage.**
- **Checks for blown fuses, accidental grounds, circuit continuity. Useful for electrical trouble-shooting in general.**
- **Warns of "live" wires and equipment, as protective measure.**

It's a "must." Saves time, money, life and limb! Order from supplier, or from

INDUSTRIAL DEVICES, INC.,
EDGEWATER 10, N. J.

VALVE TROUBLES ?
Check Your SUPER-HEAT

New '4' Way

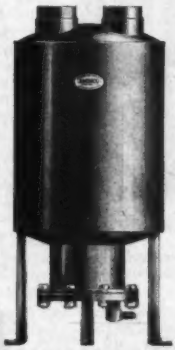


These Attachments and your Thermometers will prove it.

Sterling Silver $1.50 pr. See your Jobber.

Engineers use them, why not you?
ACME PRODUCTS CO.
P. O. Box 1956 San Antonio 6, Tex.

AMINCO
OIL SEPARATORS



Aminco Oil Separators protect compressors by maintaining correct oil level in crankcase and by excluding oil from refrigerant stream. They enable coils, condensers, valves and dehydrators to function most efficiently.

These oil separators are made for jobs from ⅓ H.P. to 120 tons and are used everywhere, ashore or afloat, where efficient refrigeration is desired.

AMINCO
Refrigeration Products of Proven Performance include

- **Constant Pressure Valves**
- **Automatic Suction Pressure Throttling Valves**
- **Water Regulating Valves**
- **Multi-Temperature Snap-Action Valves**
- **High Side Floats**
- **Filters and Check Valves**

At Your Jobbers

Full descriptive bulletins on request.

AMINCO REFRIGERATION PRODUCTS CO.
14544 THIRD AVE. • DETROIT 3, MICH.

Van D. Clothier, 1015 E. 16th, Los Angeles
George I. Boone, Rm. 730, 1775 Broadway, New York
W. H. Cody, Santa Fe Bldg., Dallas
J. C. Battles, Bondi Bldg., Galesburg, Ill.
Expert Borg-Warner, 310 So. Mich., Chicago

"Speed-Angle" is said to eliminate sharp right-angle bends and to be exceptionally suited to all applications where space at the service

valve is limited. No flexing is required in making connections.

The quick couplers incorporated in the hose are of patented design, featuring a tight sealing rubber gasket firmly entrenched in a machined groove. The gasket cannot blow out, yet it is easily replaced in a matter of seconds.

The "Speed-Angle" charging hose is tested to withstand 600 lbs. pressure. Overall length is 30 inches. Exact replacement couplers and washers are readily available from authorized wholesalers of Jarrow Products.

Plastic Drifts

THE Bonney Forge and Tool Works, Allentown, Pa., has announced a new tool called a Plastic Drift. These

Plastic Drifts are very useful tools for work where it is desired to avoid marking or damaging finished parts. They are also useful for driving out grease retainers and bearings.

Bonney Plastic Drifts are made of tough plastic material that stands up extremely well under severe pounding. These Drifts are six inches in length and come in three different sizes:

CD4	¼"	O.D.
CD6	⅜"	O.D.
CD8	1"	O.D.

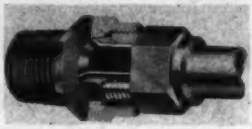
The CD Set contains one each of the above and is packed in a cardboard box.

Uniflare

A SELF-FLARING, leakproof tube fitting that can be taken apart and reconnected many times, it is claimed, without weakening the seal or damaging the flare is offered by Scovill Manufacturing Company, Waterbury 91, Conn.

This new fitting, called Uniflare has only two parts (body and nut) which makes it easy to connect. The thrust collar in the nut shears off, under ordinary wrench force, and clamps onto the tube to form a perfectly sealed joint.

By eliminating both the preliminary flaring operation and tube cracking that sometimes accompanies flaring, the Uniflare Fitting is said to save time, labor and tubing. No special skill or flaring tools are required for assembly.



Among other reported features of this new fitting are its 37° flare (for maximum strength), an inverted-type joint which provides multiple sealing surfaces, and intimate tube support designed to minimize vibration fatigue.

TRADE LITERATURE

Service Parts New Catalog

JUST off the presses, Catalog No. 48, issued by Service Parts Company of 2511 Lake Street, Melrose Park, Illinois, is one of the largest ever offered in the field. It contains 200 pages, and lists a complete line of brand-name products in

refrigeration, air conditioning, heating parts and supplies and electric motors and parts . . . everything that could possibly be needed. But despite its large size, Catalog No. 48 is streamlined to a gratifyingly modern efficiency. Its contents are arranged and indexed in a new simplified way that makes locating needed items a much quicker and easier matter. The catalog is available . . . for wholesale only . . . from Service Parts Company, in response to requests made on your letterhead.

New South Bend Catalog

BOTH the bench and floor models of the new South Bend 14" Precision Drill Presses are shown in a new 7" x 10" catalog. Also illustrated and described are motors, controls, extra spindles, and other drill press accessories. Complete specifications and prices are listed. Diagrams are used to show all important dimensions of the drill presses.

A copy of catalog No.

most complete line...

Jarrow...

Refrigerator Door Gaskets Are Again Made From Crude Rubber

Always Demand These Quality Gaskets

JARROW PRODUCTS

420 N. LA SALLE ST., CHICAGO 10, ILLINOIS

NEW! "ALCO-FLAME" LEAK DETECTOR

Here it is... the new Justrite Leak Detector, Model 1240—designed to burn alcohol. Quickly detects leaks in refrigeration systems using halide gases... helps on repair work.

This handy tool is also a soldering iron or a blowtorch. Comes complete with soldering tip and flame reducer. Easily convertible.

It's handled the same as the famous Justrite "Gas-Operated" Leak Detector. Built of the finest materials. Simple construction. Proven design.

The Justrite "Alco-Flame" Leak Detector, Model 1240, is ready for delivery. See your jobber today.

JUSTRITE MANUFACTURING CO.

2063 N. Southport Ave., Dept. B-7, Chicago 14, Ill.

Slash VALVE INVENTORY COSTS UP TO 90%

GENERAL CONTROLS engineering offers tremendous savings in inventory investment, stock space and handling costs

THE NEW SELECTIVE CAPACITY CARTRIDGE PROVIDES INSTANT SIZING ADJUSTMENT

COMPARE THESE FACTS

ORDINARY VALVES	GENERAL CONTROLS V-200 VALVES
Separate valves for each back pressure or suction temperature range. Separate valves for each capacity size.	One valve for ALL back pressure or suction temperature ranges. One valve with selective cartridge for full range of capacities

V-200 Thermal Expansion Valves available in ½, 1, 2, and 5 ton body sizes and for Freon, Methyl Chloride, Sulphur Dioxide

For Full Capacity Range in each body size at all back pressures with any one refrigerant

ONLY ONE VALVE REQUIRED FOR COMPLETE INVENTORY

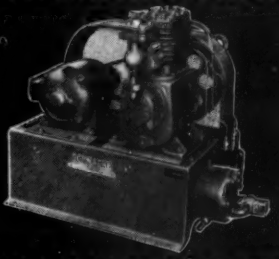
Nationally Distributed by Refrigeration Wholesalers • Request Literature

GENERAL CONTROLS

Manufacturers of Automatic Pressure, Temperature & Flow Controls

FACTORY BRANCHES AND DISTRIBUTORS IN PRINCIPAL CITIES

SCHNACKE COMPRESSORS and Complete CONDENSING UNITS



THE INDUSTRY'S MOST Easily SERVICED UNITS

For detailed Service and Engineering data, write

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1024 Columbia Street EVANSVILLE, IND.

400 may be obtained by writing to the South Bend Lathe Works, 207 East Madison Street, South Bend 22, Indiana.

★ ★ ★

ASRE Pamphlet

"REFRIGERATION of Lemons and Grapefruit" is the title of the latest brochure published by The American Society of Refrigerating Engineers.

The 10-page pamphlet, known as AD-18 R describes handling methods, coloring process, storage methods, air conditioning equipment, diseases, air distributing, etc. for lemons and grapefruit.

This AD, a completely revised edition of AD-18 published in 1940, was written by H. M. Hendrickson and J. R. MacRill. Mr. Hendrickson is chief engineer for the Ralph E. Manns Company in Los Angeles and Mr. MacRill is with the California Fruit Exchange in the field service and research department.

★ ★ ★

Bristol Bulletin

A BULLETIN describing a proportional current-input electronic pyrometer controller has just been published by The Bristol Company, Waterbury 91, Conn. The bulletin describes the application of the new instrument in proportioning the current input to electrically-heated furnaces, ovens, plastic molding machines, salt pots, and other similar equipment to provide practically straight line control. The new bulletin, No. PB1237, can be obtained from The Bristol Company, Waterbury 91, Conn.

★ ★ ★

The Tempriter

A NEW form of bulletin from Temprite has been developed and will be used to start a series of service, installations and sales information releases.

It will be called "The Tempriter" and will be written "for instantaneous reading."

Calculated to present information in an intense, striking manner for effortless reading and understanding "The Tempriter" will accentuate crispness, telling its story without lost motion.

"The Tempriter" series is the beginning of a new program intended to give the Service Engineer concrete assistance in making more money in less time with less effort.

The first release covers the subject of "Draught Beer Cooling Systems—Foam Control" and includes a CO_2 pressure-temperature relationship chart for flarity. The information presented is related to service and covers handling the "Beer too foamy" complaint.

PERSONNEL NOTES

Siegfried Elected Secretary of REMA

W. A. KINGSLAND of the Minneapolis-Honeywell Regulator Company because of a change in his business affiliations from the refrigeration to the stoker field, tendered his resignation as Secretary of REMA at its last Directors meeting.

W. A. SIEGFRIED

Elected unanimously to fill the unexpired term of Mr. Kingsland was W. A. Siegfried, president of the Superior Valve & Fittings Company of Pittsburgh.

Mr. Siegfried has been one of REMA's most active members serving on a good many committees and as a member of the Board of Directors.

★ ★ ★

Donald Heads Jack & Heintz

AT A special meeting of the Board of Directors, held September 10, in New York, Kenneth G. Donald was elected President of Jack & Heintz Precision Industries, Inc., Cleveland, Ohio, succeeding Byron C. Foy who resigned as President and Chairman of the Board, the latter position being abolished.

Mr. Donald is, and will continue as, a Vice Presi-

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Versatile Hanger Iron

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AIR CONDITIONING, REFRIGERATION & HEATING

Write for free booklet and class starting dates

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4125 Grand River **Detroit 8, Mich.**

dent of Robert Heller & Associates, Cleveland, Ohio, a nationally known management engineering firm. In addition, he has been serving as General Manager of Jack & Heintz for the past several months.

K. G. DONALD

Prior to joining Robert Heller & Associates in 1936 as Vice President, Mr. Donald was comptroller of the Royal Baking Powder Company and the Forstmann Woolen Company. He is a graduate of Harvard University and the Harvard Graduate School of Business Administration, a member of Phi Beta Kappa, National Association of Cost Accountants, Harvard Club of New York, Chicago Club, and Cleveland's Chamber of Commerce, Mid Day and Mayfield Country Clubs.

★ ★ ★

Legg Elected President of RCA

HENRI SADACCA, president of Noma Electric Corporation, announces that Edward R. Legg, formerly assistant general sales manager of Nash-Kelvinator Sales Corporation, Detroit, has been elected president of the Refrigeration Corporation of America, a Noma subsidiary. Mr. Legg also becomes general manager of Noma's Refrigeration and Stangard-Dickerson Divisions, which manufacture home and farm freezers, commercial refrigerators, ice-cream cabinets, air-conditioned candy cases and plate coils. The refrigeration Corporation handles sales for these two operating divisions.

Mr. Sadacca stated that Walter Raskin, for many years works manager of Stangard - Dickerson, has also been placed in charge of manufacturing operations at the Refrigeration Division plant.

★ ★ ★

Fedders Appointments

APPOINTMENT of Henry F. Goetz as Sales Engineer and William W. Reeves as Applications Engineer is announced by A. J. De Fino, Manager of the Condenser Division of the Fedders-Quigan Corporation, Buffalo, N. Y.

H. F. GOETZ

Mr. Goetz is a mechanical engineer and has wide experience in manufacturing practice which will prove very valuable in the field of heat transfer and refrigeration manufacturers. Mr. Goetz is a veteran of World War 2 and served in the Army in the capacity of Major.

Mr. Reeves had been in the Fedders-Quigan Corporation for approximately two years and received basic training in the Engineering field as

W. W. REEVES

a Design Engineer. He is a graduate of Massachusetts Institute of Technology and is a member of the American Society of Refrigeration Engineers. With the basic background received in the Engineering Department Mr. Reeves will prove of great value in his contacts with members of the Refrigeration Industry.

★ ★ ★

Worthington Depts. Combined Under Hamilton

C. E. WILSON, Vice President, Worthington Pump and Mahinery Corporation, announces that the Air Conditioning and Refrigeration Distributor Service Department has been combined with the Air Conditioning and Refrigeration Sales Division. The new department will be under the direction of

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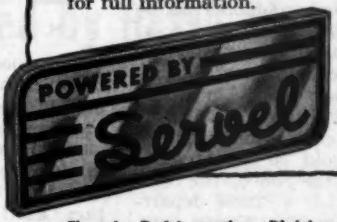

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RECORDING INSTRUMENTS of Air Temperature and Motor Operation

These instruments take the guesswork out of trouble-shooting on any type of refrigeration equipment. With them you can automatically chart a written record of the true performance of the equipment you are servicing in the home, store, or cold storage plant. Such charts, taken before and after the job, are good proof of work well done.

Tempscribe styles for refrigeration service:

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Ask your jobber about TEMPSCRIBE or write for Bulletin 731.

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E. C. Hamilton as manager, with headquarters at Holyoke, Mass.

E. C. HAMILTON

Among the products affected are packaged air conditioners; Freon condensing units and Freon compressors (reciprocating); evaporative condensers, Freon and ammonia; fan and coil assemblies (air conditioning and refrigeration service); ammonia boosters (Series HA); combined ammonia units; vertical ammonia compressors (3x3 to 10x10 inclusive), shell-and-tube coolers and condensers sold in combination with the above. The combination of these departments, Mr. Wilson says, will strengthen the field organization and improve the service rendered to Worthington distributors.

Mr. Hamilton has been associated with the Holyoke works since 1938, and in 1943 was made manager of the Air Conditioning and Refrigeration Service Dept. He is a member of the Refrigeration Service Engineers Society, and the American Society of Refrigeration Engineers. Formerly of Glenwood, Iowa, Mr. Hamilton attended Des Moines University and Coyne Electrical College. He resides in Holyoke, Mass. with his wife and three children.

★ ★ ★

Kirkwood to Head Mills Service

HILAND G. KIRKWOOD has been named General Service Manager for Mills Industries, Incorporated, 4100 Fullerton Avenue, Chicago.

H. G. KIRKWOOD

Kirkwood, who has been in the refrigeration field in sales, service, and engineering work for the past 22 years, was formerly associated with the Frigidaire Corporation and Refrigeration Engineers, Incorporated, of Los Angeles.

★ ★ ★

Ambrose Heads United Motor Industries' Sales

WM. D. AMBROSE, formerly with Mills Industries, Chicago, is now sales manager for United Motor Industries Corporation, 33 N. LaSalle Street, Chicago.

Mr. Ambrose was affiliated with Mills for eighteen years—thirteen as service manager and for five years in sales.

United Motor Industries Corporation is engaged in the manufacture of compressors and condensing units.

★ ★ ★

Keefe Appointed by Chicago-Wilcox

WM. D. KEEFE and Sons of Chaffee, New York, has been appointed representative in the states of New York, Pennsylvania, New Jersey and Northern Ohio, for Chicago-Wilcox Mfg. Co., according to a recent announcement.

Bill Keefe has long been associated with the refrigeration industry and is well known to the trade.

★ ★ ★

Penn Names Persons In St. Louis

R. L. PERSONS has been named district manager of the St. Louis, Mo. territory for Penn Electric Switch Co., according to an announcement by R. H. Luscombe, general sales manager. He replaces O. G. Tinkey, former manager.

Before joining Penn, Persons was Assistant Sales Manager of a division of McQuay-Norris Manufacturing Co. of St. Louis. Previously he held a similar position with the L. M. Persons Corporation of the same city. Persons has had considerable field engineering experience and is well versed in the application of controls for heating, refrigeration, air conditioning, pumps, air compressors and safety controls for engines.

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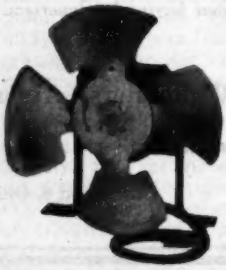

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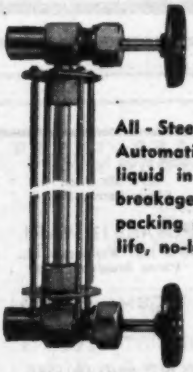

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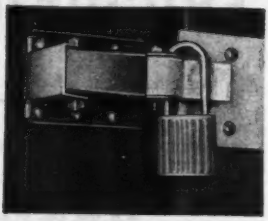

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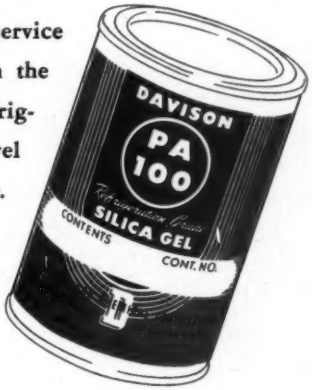

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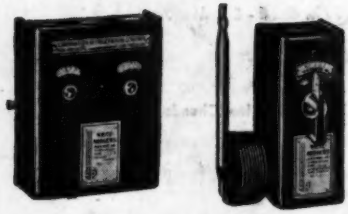

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